

THE IRON AGE

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RYERSON

... THE IRON AGE ...

FEBRUARY 18, 1937

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Big Money Contests

IT IS encouraging to note that "big money" is being offered for brains. Not so long ago, the chief reward for exceptional skill and ability along specialized lines of endeavor was to be found in the field of pugilism. Even 10 or 15 years ago, one who was notably proficient in projecting his fist to another man's chin might realize, in fistic combat, an opportunity to secure a prize of \$200,000 or more.

Within the past few weeks, similar total rewards have been offered by two concerns for contests in which mental ability and not physical prowess is the deciding factor.

One of our well known makers of cigarettes is conducting a contest to popularize its brand, in which the total prizes aggregate \$200,000. We may be in error, but it is our belief that this sum represents just about the "tops" so far in a merchandising promotional contest.

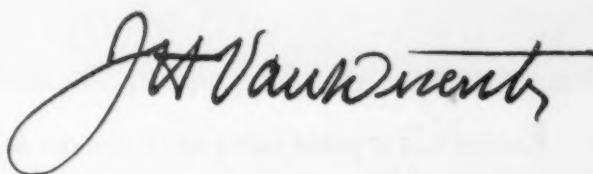
Of course, we expect bold merchandising strokes from the tobacco people, who tap such a broad section of our American consumer demand. They will probably get their money's worth in increased sales, but the contest is not particularly designed to improve the quality of their product.

"Tops" in the industrial field and in the intellectual contest line is undoubtedly represented in the \$200,000 prize offer of the Arc Welding Foundation established by James F. Lincoln, announced on page 93 of The Iron Age of Feb. 4. It is "tops" for the metal-working industry, not only in dollars but in purpose, for its purpose is to draw out ideas and experience that will improve and enlarge the useful application of arc welding.

While fundamentally devoted to the purpose of improving the art of welding, this contest has splendid possibilities from the apparatus merchandising standpoint, for the soundest and surest way to expand the use of a functional product is to broaden its inherent usefulness of application or to disclose its usefulness in fields not already known.

Incidentally, this is a broad gage contest which will aid the whole industry. You do not need to inclose the "wrapper" or packing case from a Lincoln welder in order to qualify your entry!

More such contests should help the metal-working industry.



Cuts Malleable Annealing Cycle



THE control of the various conditions which affect the annealability of our iron has been the subject of investigation for a number of years. It is naturally necessary to understand thoroughly all the factors which influence the annealing of our iron to make it possible to produce a satisfactory casting in the shortest possible time. The slightest variation in one of the factors affecting the annealing is sufficient to produce an unsatisfactory casting.

Before the new furnace was constructed, a great deal of work was conducted in the laboratory in an electric experimental furnace with a program control. The various phases of the annealing cycle were studied, which included, bringing to temperature, holding at temperature, rapid cooling and slow cooling time. The minimum time of each of these periods was plotted as the ideal annealing cycle, and the di-

visions in the new furnace laid out accordingly. This work was conducted on many irons made under various conditions, and finally led to what is called a standard annealing cycle. Periodically, iron is checked in the laboratory furnace as a check against the operation of the large furnace using the standard cycle. This gives us a check on the factors which affect the rate of graphitization, such as, chemical composition, raw materials, change in casting, pouring and melting conditions, together with the temperature control and cycle used on the production furnace.

The Saginaw Malleable Iron Division is a pioneer in shortening the annealing cycle in the production of regular malleable iron. In 1920, the first tunnel kiln for annealing malleable iron was built in Saginaw, replacing the old type periodic ovens. This reduced the annealing cycle from 8 to 6 days. During 1922, the annealing time

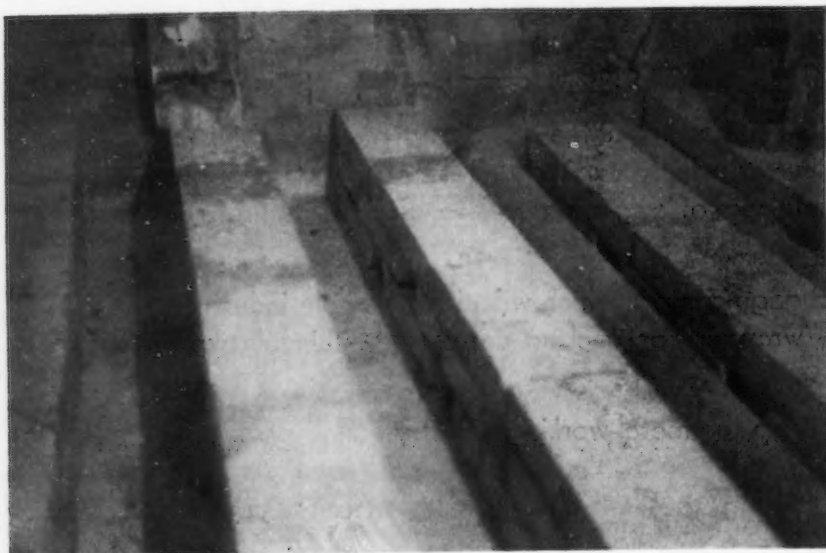
RESEARCH and development work during the past few years has resulted in reducing the time of graphitization of white cast iron in the production of malleable iron. This is generally referred to as the annealing process.

Malleable foundrymen have long felt the desirability of reducing the time required to anneal their product. The former 7 to 9-day annealing time was by far too time consuming, and naturally very

was cut to 5 days, and by 1926, by more rigid control of the heating and cooling zones, and by slightly changing the original kiln construction, the time was again cut to a 4-day cycle.

In 1931, a new kiln was constructed, embodying modern principles of heat recirculation and providing flues on the cars underneath the loaded pots. The annealing cycle on our iron was further reduced to 59 hours. At that time, nowhere in the country was malleable iron annealed on a production basis in much less than 100 hours.

Again, in 1936, the Saginaw Malleable leads the malleable industry by annealing regular malleable iron on a 30-hour cycle. This accomplishment was made economically possible on a commercial basis mainly by the perfection of the radiant heating tube and increased knowledge of controlled atmosphere. The improvement in furnace design has gone hand in hand with the metallurgical control in melting and annealing, and the latter is greatly responsible for assisting in reducing the annealing cycle.



RETURN bend of radiant heating tube before alloy rails were installed.

49 Per Cent

By CARL F. JOSEPH

Metallurgist, Saginaw Malleable Division, General Motors Corp.

costly. Saginaw Malleable Iron Division of General Motors for many years has operated continuous annealing furnaces. Not satisfied with the 59-hour cycle it determined to further reduce the time. The new radiant tube furnace, with controlled atmosphere, as described in this article, is the first of its kind in the industry. It produces a standard commercial malleable iron in a 30-hr. cycle.

The table at top of page 30 shows a comparison of annealing time during the past 16 years at Saginaw.

The furnace just installed at the Saginaw Malleable is a roller rail type continuous annealing furnace. It handles four individual rows of work loaded on trays approximately 2 ft. x 3 ft., which carry the castings through the furnace. Each row holds 46 trays within the inner doors, measuring 101 ft. 6 in. The four rows of trays ride on roller rails and each row has a separate hydraulic pusher mechanism. All exposed parts within the furnace, together with the trays and side of liners, are made of 35-15 Ni-Cr and 12-15 Ni-Cr alloys.

In order to prevent scaling of the casting, also to provide the proper atmosphere for annealing, so as not to carburize nor decarburize, the atmosphere must be controlled within very close limits. The atmosphere at present is around 12.5 per cent CO and 6.5 per cent CO₂. The entire structure is encased in a welded gas tight casting. Removable top plates provided with oil seals supply the entire roof with a

gas tight seal. Each end of the furnace is provided with a vestibule, having inner and outer doors, one of which is always closed to prevent air infiltration when charging and discharging. This is necessary to maintain the desired atmosphere. Each of the vestibules is purged with DX gas containing 1.5 per cent CO about 12 min. before each "push." Also, about 3000 cu. ft. per hour of DX gas is allowed to flow into the furnace atmosphere.

The overall dimensions of the kiln are 115 ft. x 20 ft. The trays are loaded to a maximum height in the center of 18 in. About 750 lb. of castings are charged per tray, with the trays and liners weighing an additional 325 lb. Every 40 min. a "push" is made, when operating on a 30-hr. cycle, giving a daily production of about 55 tons of castings.

From the charge end through the rapid cooling section, the con-

struction of the furnace is as follows:

SIDE WALLS: 9 in. of insulating refractory, plus 3 in. block insulation, plus 2 in. of Magnesite block, total of 14 in.

FLAT ARCH: 9 in. of insulating fire brick, plus 7 in. insulating powder. The refractory is suspended by heat-resisting alloy hangers attached to overhead supports of steel.

BOTTOM: 2½ in. of fire brick, plus 10 in. of insulating brick between the piers.

The slow cooling zone consists of:

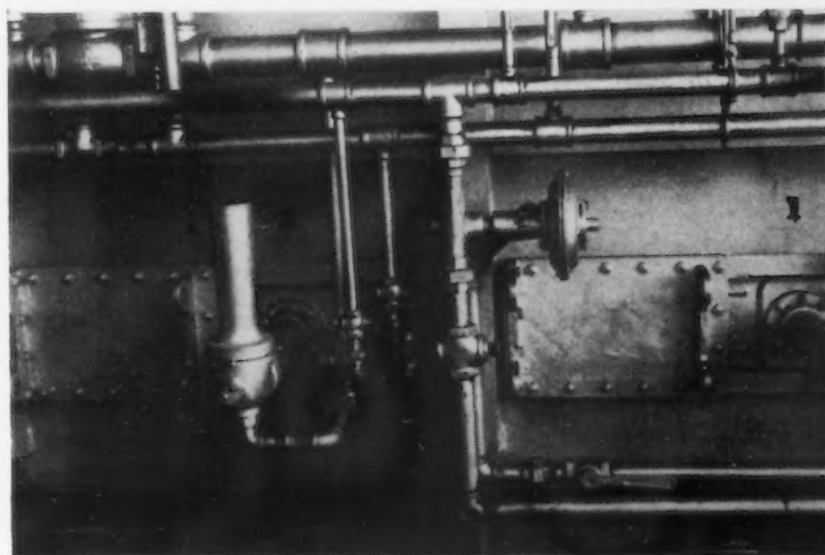
SIDE WALLS: 9 in. of fire brick, plus 3 in. of block insulation.

FLAT ARCH: 9 in. of insulating fire brick.

BOTTOM: 5 in. of fire brick, plus 5 in. of insulating brick.

There is a refractory muffle between the tubes and the work which disperses the heat evenly, giving very uniform cooling.

The firing of the furnace is accomplished by 45 U-shaped radiant tubes and low-pressure natural gas burners. These tubes are made of



DETAIL view of burner equipment for one radiant tube.

heat corrosion resisting alloy 3 in. and 4 in. in diameter. These tubes are arranged above and below the work and distributed throughout the entire length of the furnace as follows:

ZONE 1. 6 above and 6 below the work. The lower tubes are a larger type, having a 4 in. diameter firing leg and a 3 in. diameter exhaustor or return leg. The first three upper and first three lower tubes are so manifolded that they are fired to capacity continuously.

ZONE 2. 3 above and 7 below, all tubes 3 in. inside diameter

ZONE 3. 3 above and 9 below, all tubes 3 in. inside diameter.

ZONE 5. 11 below, all tubes 3 in. inside diameter.

Each radiant tube is provided with a specially designed combination pre-mix and diffusion type of burner so that each tube can be controlled independently. The special function of this burner is to produce a long radiant flame inside of the tube, producing a uniform temperature along the walls of the tube.

Each tube is equipped with an exhaustor which creates a negative pressure inside of the tube, thereby preventing any leakage of products of combustion into the furnace chamber in case of a tube failure or leakage of a welded joint. The furnace is operated at a maximum temperature of 1750 deg. F. in the holding zone, with a temperature variation of less than 20 deg. across the hearth.

Heat resisting alloy pipes are arranged above and below the work. Air is circulated by means of a fan through the cooling tubes. The temperature is automatically controlled so that the end of the rapid cooling zone is maintained at 1400 deg. F. The drop in tem-

ANNEALING TIME IN PAST 16 YEARS

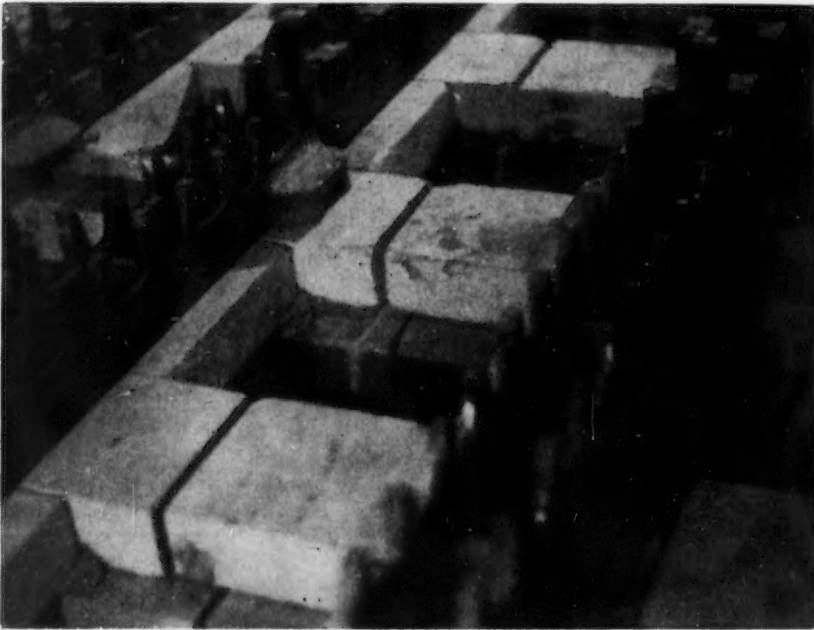
	Periodic Ovens Prior to 1920 Hr.	First Tunnel Kiln—1920 Hr.	Second Tunnel Kiln—1926 Hr.	Third Tunnel Kiln—1931 Hr.	Radiant Tube Fur- nace—1936 Hr. Min.
Bringing up to temperature	40	28	22	16	8 30
Holding at temperature....	72	45	27	21	10 ..
Rapid cooling .....	..	..	..	9	1 45
Slow cooling	80	71	55	13	10 24
Total time	192	144	104	59	30.65 ..
Per cent increase in anneal- ing time over 1936.....	626	470	340	192	.. ..

perature of 350 deg. in six feet is accomplished in 1.5 hr.

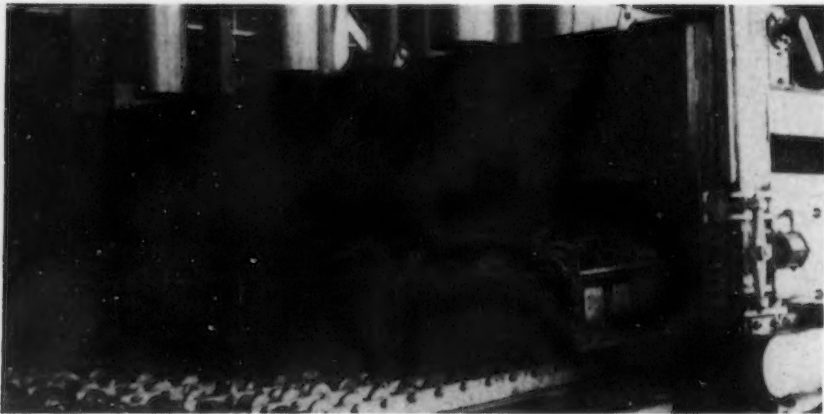
The kiln may be operated either automatically or manually. The normal operation is automatic, a complete cycle being accomplished by means of electrical relays and limit switches, as follows:

At the beginning of a new cycle,

the inner and outer doors are both closed, the outer doors being locked tight by an air cylinder locking mechanism, and the discharge is being purged. At this time a red signal light glows at the charge end to notify the operator that everything is in readiness for loading the charge vestibule. The

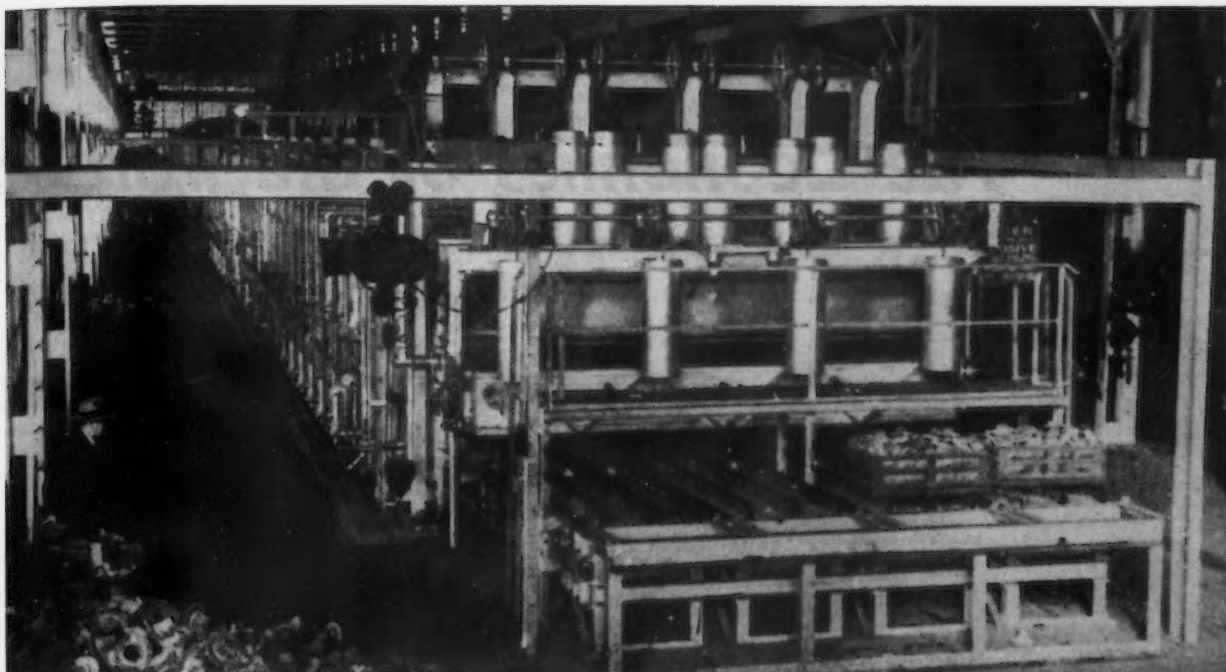


ALLOY rails in place.



FOUR loaded trays leaving discharge vestibule.

operator unlocks the outer charge door by means of a push button, and upon raising the door manually, the red signal light goes out. He then rolls the trays manually into the charge vestibule, and upon lowering the door, it automatically locks and the purge valve to the charge vestibule is opened simultaneously. A timer, which may be set for any desired purging time, operates a green signal light at the end of the purging interval and signals the operator to start the "push." Upon pressing the button to start the "push," the purge



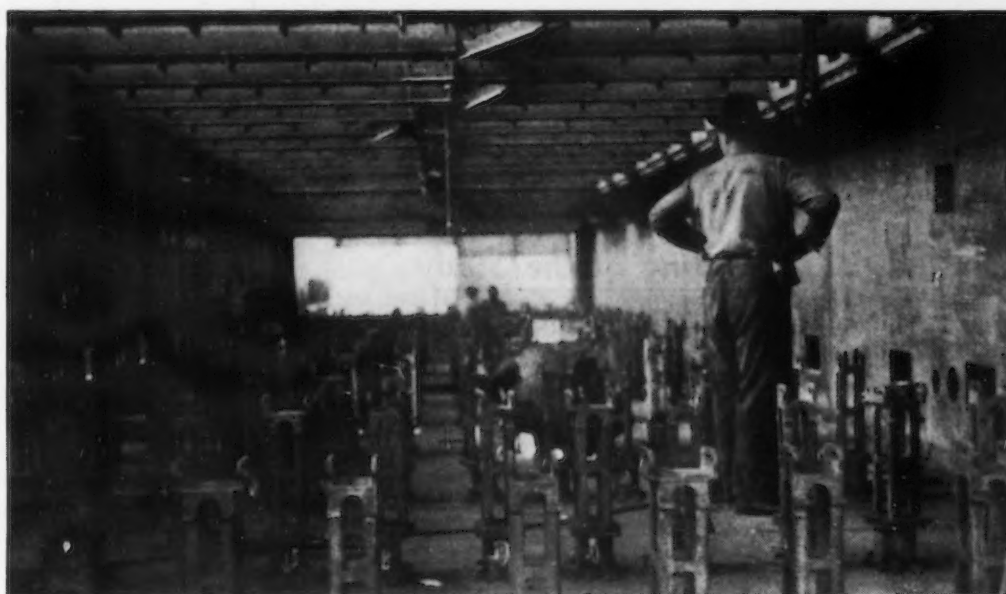
ABOVE

GENERAL view of furnace looking at the charge end. Note ejectors along left side of furnace.

o o o

AT RIGHT

WELED steel case and alloy stools for anchoring alloy rails.



valves at both ends of the kiln close, the green signal goes out and the inner doors raise. When both inner doors are completely open, the four pushers start to push the rows of trays forward. Within five minutes the four trays at the ends of the rows operate their respective limit switches, located in the discharge vestibule, which reverse the pushers to return them to their original position. Power driven rolls in the discharge vestibule then move the trays completely into the vestibule so that they are clear of the inner discharge door. This

inner door then lowers, and upon being completely closed, unlocks and raises the outer door. When the outer discharge door is completely open, the discharge rolls again turn and roll the trays out of the vestibule onto a receiving table. As the trays pass beyond the outer door, they pass over limit switches, which lower the outer discharge door and stop the discharge rolls. The door being completely closed, locks itself, and opens the valve for purging the discharge vestibule. In the meantime, the pushers having returned

to their original position, lower the inner charge door, and the red light again signals that the cycle has been completed and everything is in readiness for a new charge.

It is anticipated that the cycle may be shortened even further due to the fact that it is possible to accurately control the heating and cooling rates of a thin layer of work, without heavy pots, by employing heating and cooling tubes both below and above the work. Furthermore, all the advantages of the atmosphere control have thus far been realized.

The Economics of the Iron and

THE IRON AGE is permitted to present in this issue a summary of the findings of the Bureau of Business Research of the University of Pittsburgh in a research investigation on "The Economics of the Iron and Steel Industry, which will be presented in book form (two volumes) this month by the McGraw-Hill Book Co., New York. The report was written by Dr.

Carroll R. Daugherty, professor of economics, University of Pittsburgh; Dr. Melvin G. de Chazeau, associate professor of commerce, University of Virginia, and Dr. Samuel S. Stratton, associate professor of business economics, Graduate School of Business Administration, Harvard University, under the supervision and editorship of

I. Setting of the Study



IN agreeing to investigate the economic effects of the Steel Code we took upon ourselves a heavy responsibility, a responsibility analogous to that assumed by a court of law when it adjudicates a complex economic issue affecting the pecuniary interests and emotional reactions of many conflicting groups. There is, however, one important distinction between judicial responsibility and research responsibility. The findings of a court carry with them the sanction of law and, through the executive arm of government, the means of enforcement; whereas the findings of a research group carry no sanctions and no weight except as they operate through public opinion, except as they appeal to the minds of men as fair, reasonable, and competent. In discharging our quasi-judicial function, we have sought to get at the evidence and to explore the issues in a spirit of objective inquiry. The findings are now incorporated in a two-volume work to be released in February by the

McGraw-Hill Book Co., of New York, under the title, *The Economics of the Iron and Steel Industry*. There the reader will find summary statements of the findings as well as a detailed presentation of the factual and logical basis of those findings. In the short period available we can do no more than sketch in broad outline a few of the conclusions from the investigation. It will be appreciated, then, that it is scarcely possible in such a summary to avoid oversimplification and seemingly dogmatic statements. Our defense must be to refer you to the published work for the supporting evidence and analysis as well as for a summary of the many other conclusions not discussed in this paper.

Merely for convenience in this presentation I shall speak of "our findings" and say that "we" found this and "we" found that. I want to make it clear, however, that the three authors of the work are due full credit for the analysis made and the conclusions drawn. Dr.

Carroll R. Daugherty, of the University of Pittsburgh, conducted the labor phases of the inquiry; Dr. Melvin G. de Chazeau, of the University of Virginia, the price and distribution phases; and Dr. Samuel S. Stratton, of the Graduate School of Business Administration, Harvard University, the phases relating to costs, profits, and production. My responsibility as director of the Bureau of Business Research was limited to general supervision and to the editing of the manuscript for publication, and my task here is merely that of presenting selected items from the authors' findings. Let me say, also, that limitations of time and the complexity of the industry dictated a division of responsibility among the authors, primarily between those phases of the industry's economic structure which have their direct incidence on price and those affecting labor. Dr. de Chazeau and Dr. Stratton are responsible for the conclusions on price and related problems, and Dr. Daugherty is responsible for the conclusions on labor problems.

Financial support came in part from the Brookings Institution but

Steel Industry

o o o

A resume by
Dr. Ralph J. Watkins,
Director of the Bureau of
Business Research,
University of Pittsburgh

o o o

Dr. Ralph J. Watkins, director of the Bureau of Business Research. The first summary of the findings of the committee were made public Monday evening, Feb. 15, by Dr. Watkins in a talk before Maurice and Laura Falk Foundation at Pittsburgh, and excerpts are published herewith. Some of the findings are highly controversial, par-

ticularly those relating to labor matters in the iron and steel industry, but are published because of the widespread interest that probably will greet this work at a time when labor relations in industry are much in the public eye. The publication of some statements does not imply that THE IRON AGE is in agreement with the position taken by the authors.

primarily from the Maurice and Laura Falk Foundation. In view of the highly controversial nature of the subject matter of this inquiry, early in the conduct of the investigation it was agreed, at the suggestion of Mr. J. Steele Gow, executive director of the Falk Foundation, that no parts of the manuscript should be seen prior to publication by anyone connected with the foundation. That agreement was scrupulously observed. Therefore, this presentation represents the first view of our findings by the foundation. Although the Brookings Institution suggested the study and was helpful with advice throughout its conduct, it has no responsibility for the analysis made or for any of the conclusions reached.

Finally, this statement would not be complete without mention of the Buhl Foundation under a grant from which an extensive program in regional economic research has been under way at the University of Pittsburgh since 1929. This study of the steel industry would not have been possible had it not been for the research facilities al-

ready in existence and the contacts with the steel industry which the bureau's regional program had provided.

In presenting the findings of our study I shall attempt to do two things. First, I shall outline some of the conclusions which have a close bearing on current problems

of the industry, and, second, I shall direct your attention to certain broader questions of public policy concerning which inferences may be drawn from the study as a whole. These questions of public policy are dealt with in the published work in a brief epilogue at the end of Volume II.

II. Some Conclusions from the Study

The conclusions will be discussed under three heads as follows: (1) Conclusions concerning the Steel Code as an effective instrument for solution of the problems of the industry and concerning its administration; (2) Conclusions pertaining to the price problems of the tonnage steel industry; and (3) Conclusions relating to collective bargaining in the industry.

1. The Code and Its Administration

The Steel Code was not only an experiment in industrial self-government, it was also a bargain. In return for undertaking to increase

the rate of wages, reduce hours, and spread employment in the face of severe pecuniary losses, the industry received a mandate to set up rules and regulations that would eliminate secret price-cutting and preserve and perfect an artificial system of determining delivered prices.

The Code may be said to have achieved its primary objectives—an improvement in the conditions of labor and an elimination of “destructive” competition. But as a medium for the permanent control of the industry its administration disclosed certain vital weaknesses. Products were chosen for adminis-



Photo by Robert Yarnall Richie

tration under the Code without adequate consideration of their economic characteristics, with the result that many products which did not require a basing-point system of pricing, and had never been so priced, were forced arbitrarily to conform. Basing points were designated on the basis of tradition and compromise without adequate analysis of their repercussions upon the interests of consuming groups. No attempt was made to minimize price discrimination in the selection of these points, and alterations in basing points to conform with changes in production and demand were made difficult rather than easy. But these are errors of form which might be corrected in a scheme of codification adopted under less pressure and after more deliberation. The fundamental weakness of the Code, as an experiment in industrial self-government, is discovered in the industry's dominant philosophy. The industry was given an almost unrestrained grant of power to regulate its own affairs. The Code Authority—the board of directors of the American Iron and Steel Institute—was made the supreme arbiter in the industry and vested with powers at once

legislative, judicial, and administrative. These powers were used not to reduce price discriminations to a minimum and stimulate efficiency in production and distribution, but to ferret out practices that permitted price concessions and to eradicate them with new regulations. The domination of a few concerns led to a rigorous control of the pricing mechanism, sometimes to the detriment of smaller members of the industry, often to the disadvantage of consuming industries and distributors. Little evidence of anything that could be interpreted as broad economic planning was discernible. In short, the industry's experience under the Code demonstrates the futility of expecting an economic reorganization of an industry's policies and practices by centering authority in a group whose financial interests may be adversely affected by the alteration. Industrial self-government, if it means regulation by an industrial body unchecked by some impartial agency, cannot be expected to protect the interests of industrial minorities, consuming groups, or the general public.

Without any reflection on the good faith and public spirit of the

members of the Code Authority, it may be said without qualification that the checks imposed upon that body were entirely inadequate to secure proper protection and control. The deputy administrator's office in the National Recovery Administration had neither the power nor the staff to secure an active supervision in the public interest. The fundamental theory that, in return for certain minimum wage and hour standards and for the expectation that employment may be increased and that the bargaining position of labor may be improved, an industry may be permitted to determine its own "fair trade practices," to determine its own pricing mechanism, and to enforce its determinations with prohibitive fines collectable at law is contrary to all experience and inconsistent with all democratic precepts. There is no assurance of equity or of social economy in such a bargain. A code authority, no matter what its lineage, must be regarded as exercising a public, not a private trust. It is the theory of industrial self-government, as it was put into practice under the Steel Code, that is subject to grave question. It is submitted as a general principle that a body with its own financial interests at stake and with wide powers to develop and enforce its own prescriptions is not a safe defender of the public interest.

2. The Price Problem of the Tonnage Steel Industry

(a) *Theoretical Analysis*—It has been emphasized in this study that the method of pricing which is socially desirable for any given product cannot be ascertained on *a priori* grounds nor can it be resigned uncritically to the repercussions of those much abused and widely misunderstood forces, supply and demand. Only a careful analysis of the economic forces which impinge upon the production, distribution, and demand for a given product may be expected to indicate the type of pricing system which will secure desirable results.

Under free competition the benefit of improvements in industrial technique and in shifts in production from the inefficient producer to the efficient producer will be reflected in improved quality of the product and in lower price to the consumer. It follows that free competition is in the public interest, for it results in the largest possible

production and widest distribution at the lowest prices justified by marginal costs. But the evolution of capitalism, although it has brought increasing efficiency of production, has tended to develop in the direction of rigidity rather than flexibility of costs. Capital equipment is not only fixed in the sense that, once the investment is incurred, total capital costs vary but little with the rate of utilization and in the sense that a machine adapted to one product or type of products can seldom be used in the production of another, but modern capital equipment violates another major principle of flexibility—it will not permit the addition or subtraction of small increments of productive capacity. These elements of inflexibility are particularly evident in the steel industry, especially in the production of tonnage products.

The investment required in an integrated steel plant, together with the tendency to concentrate those plants in well-defined areas of low assembly costs and to provide efficient utilization of steel-making capacity by the contiguous building of rolling mills, so limits the number of independent units or companies that no integrated steel producer can ignore the repercussions of his own actions upon his competitors. A prerequisite to simple competitive price—that each producer may disregard the consequences of his own acts—is absent. He has no assurance that a price cut will increase his share of the business. Indeed he is aware that his competitors, rather than withdraw from the market, can and will meet his price or undercut it, irrespective of total costs.

The beneficent influence of free competition is even more dubious in the steel industry because of the inelastic demand for its products. That is, although the quantity that will be taken off the market may increase as price is lowered or decrease as price is raised, the change in quantity demanded is never proportional to the change in price but is determined primarily by general business conditions. Thus, the pressure to reduce price is confined to the desire to capture a larger proportion of the existing market. When this possibility is slight, price-cutting, if exercised at all, tends to be discriminatory. Retaliation may be avoided by price discrimination on a product basis, a

customer basis, or a geographic basis. Such price concessions may take one of two forms. First, the mill may quote a price lower than that quoted by its competitors by shading the base price, by waiving extras, or by granting rebates. In the hands of a dominating customer, the "secret" price concession seldom remained a secret to the trade but was used as a weapon to play one mill against the other. Where a very few customers may account for more than three-quarters of the entire industry's output of a given steel product and where overhead costs are a high proportion of total costs of production, such a breach in the pricing structure may be widened into price disorganization. That this result has not been a frequent one in the steel industry suggests the possibility that the concessions facilitated a general discrimination between large buyers and small buyers under the basing-point system without any serious price competition among the important producers of steel. The second type of discrimination is that inherent in any delivered price system, unless all productive capacity is concentrated at a single point. Without shading the delivered price at any given point, the mill may take business far afield, requiring variable amounts of freight absorption on its part, and therefore receive varying mill-net prices for its steel. This practice permits a mill to select its losses with respect to its own operating ratio and the desirability of the particular order taken, without risking a price war that would threaten its financial stability irrespective of its productive efficiency.

With a small number of important producers, the larger the overhead costs, the greater the fixed capital necessary to production, the less mobile the sources of supply, and the less elastic the demand for the product, the more inevitable is a pricing system that is discriminatory in this geographic sense. All these conditions apply forcefully to tonnage steel. Irrespective of the presence or absence of monopoly, in the popular sense of a combination of producers banded together to fix price, ineradicable economic factors preclude a simple competitive price for tonnage steel. "Cut-throat" competition and its sequel—price and market disorganization—might be forced on the industry for a time (i. e., until finan-

cial control or price leadership became operative), but never pure competition. It is therefore futile and irrelevant to hazard a guess at what the price of a given tonnage steel product at any given point might be "under conditions of free competition," for these conditions do not exist and could not be imposed on the industry. It is pertinent to inquire if the price is fair and reasonable and if the pricing system is designed to promote the long-run interests of the industry, of consumers, and of the public. And it is important to require that these interests be protected against the monopolistic manipulations of sellers.

If this analysis is accurate, it is clear that the requirements of producers, consumers, and the public, taken in conjunction with the economic conditions under which finished rolled tonnage steel must be produced and distributed necessitate a pricing system which will permit freight equalization among mills, stability in the published base price, and reasonable simplicity in the price structure. The economic fact, which cannot be legislated away, is that we are dealing with an industry in which a free competitive price equilibrium is not economically possible. Whatever the pricing mechanism used, the public interest may require some degree of supervision.

(b) Pricing of Iron and Steel under the Code — The outstanding feature of the price records examined is the absence of monthly fluctuations. Price changes were made in an orderly manner, and for long periods no change in quoted price was registered. This inflexibility in the face of variations in production and in demand, so different from the traditional behavior of wholesale prices, is no doubt exaggerated by the nominal character of published price quotations, especially for the pre-Code period. Nevertheless, it is doubtful if any amount of correction for actual conditions would materially alter the general aspect of the curves. The comparative results are in harmony with the preceding theoretical analysis. The economic conditions under which tonnage steel is produced and sold dictate administered prices, and fewness of important sellers maximizes the probability that these administered prices will be identical.

The marked characteristic of

pricing policy, as it is revealed by the analysis of price filings under the Code, is the absence of independent action by the smaller producers of steel and, indeed, even by most of the large integrated firms. With few exceptions, fixed basing-point differentials were maintained whether prices were raised or lowered. Price uniformity at individual basing points was the rule rather than the exception. These phenomena occurred during a period of exceptionally low utilization of capacity. These findings are inconsistent with the existence of pure competition either at or between basing points. Under the economic conditions which mark the production and sale of tonnage steel, they are inadequate to prove collusion, but the absence of well-established price leadership in the face of simultaneous and identical action among groups of independent companies establishes a presumption that prices were altered under the Code by some measure of predetermined agreement.

The conviction that the benefits of free price competition are economically unattainable in the tonnage steel industry has developed from a theoretical and a practical study of the case. With few qualifications, the evidence indicated general price control; whether this control was through agreement or through price leadership is inconsequential. The practice is compatible, even in the absence of collusion, with the economic conditions that characterize the production and distribution of tonnage steel. If the analysis in this study is sound, the problem is not how to force unrestricted price competition on steel mills—an undesirable condition and an impossible task in the long run—but rather how to curb those monopoly elements necessary for efficiency and how to afford the maximum protection from the potential evils associated with monopoly. If collusion were the core of price control, it would be logical to recommend methods of price filing calculated to hinder agreement. But the economic structure itself is responsible. Price control in steel cannot be uprooted by legislation, and it cannot be appraised intelligently without a knowledge of comparative costs.

This broad conclusion is unavoidable: the tonnage steel industry represents a problem in monop-

oly and monopolistic competition—not merely a so-called “trust” to be scattered by the courts or the Federal Trade Commission but an economic structure inherently monopolistic. A fair price for steel and the elimination of preventable social waste can be assured under private ownership only if some form of control can be made effective.

3. Collective Bargaining in the Industry

The labor provisions of the Steel Code were settled, during a period of inexperience and emergency haste and stress, through a bargaining process in which the industry held most of the power and most of the strategic positions. The industry agreed to raise certain of its labor standards and to make labor contributions of a financial nature to the objectives of the Recovery Act. But it openly announced its intention of interpreting the collective-bargaining section of the Code according to its own lights. These provisions represented the relative economic strengths of the parties to the Code; they were the resultant or component of the pulls and pressures exerted by a powerful, experienced industry, by a less powerful, less experienced Government, and by weak, unprepared labor groups. With regard to the collective-bargaining provisions of the Code, the Government labor boards, faced with weak unions and with obdurate, powerful anti-union employers standing on their constitutional rights, failed, in spite of notable attempts, to resolve the major issues of collective bargaining and union recognition.

With respect to employment security under the Code, certain changes in hiring and welfare practices undoubtedly did something to relieve the feeling of insecurity. The suspicion of paternalism, moreover, appeared to be less prevalent because of the introduction of employee-representation plans, which were advances beyond the one-sided autocracy of pre-Code days. The movement for independent unionism in the industry, which at first the Recovery Act fostered, was for a while a potent threat against arbitrary action by management, and Section 7(a) of the Act operated to prevent and curb management from wide use of retaliation

measures (chiefly the discharge weapon).

There was, thus, a net gain in the direction of employment security. Although significant, as the possible beginning of an important trend, this advance, nevertheless, was not so great or far-reaching as to justify the conclusion that the iron and steel companies had relinquished any basic element of their control over employment relations and over the determination of employment security. Some of the methods were changed, but not the objectives.

There can be little doubt that the passage of the Recovery Act in June, 1933, marked the beginning of a new period in labor relations in the United States—new, in that it brought to the surface certain attitudes that had been developing in the minds and emotions of American workers and in that it brought to the fore the issue of organization. No objective analyst of labor events under the Recovery Act can fail to be convinced that most of the country's wage earners were ready for collective or group action and that the main issue was over the form which it was to have. The immediate question was whether the existing “outside,” “independent” unions or the “inside,” company unions were better suited, structurally and functionally, to meet the workers' urge and need for collective action.

Before the Code period only 2 per cent of the iron and steel-workers were covered by trade agreements developed through the practice of collective bargaining between independent unions and managements; about 20 per cent of the workers were covered by employee-representation plans which, although failing to function as collective-bargaining agents for the determination of basic employment conditions, served as more or less satisfactory media for the adjustment of individual grievances. Consequently, not only were about 98 per cent of the workers in the industry without true collective-bargaining facilities, but almost 80 per cent of them lacked any organized means whatever for democratic protection against possible arbitrary actions by foremen and other immediate supervisors, against possible paternalism of company policies, and against possible unfavorable exercise, by company

executives, of untrammelled economic (and sometimes political) power.

Under the Code, however, more than 90 per cent of the workers had opportunities for grievance settlement through employee-representation plans. Perhaps 10 per cent, on the average, were organized in outside unions.

All in all, granted the extenuating circumstances of haste, company opposition, and insufficient funds, one is nevertheless justified in concluding that the Amalgamated Association of Iron, Steel and Tin Workers during the Code period was unable to make the structural and functional adaptations required by the Code environment and that its constitution was in general unsuited to meet the needs of industrial unionism in the iron and steel industry. Most of these adjustments were long overdue, but with the financial and leadership resources available in the Code period it would have been expecting too much that the adaptations be made within the short space of two years.

The great increase in the number of employee-representation systems must be attributed to the Steel Code in its Recovery Act setting, i. e., to the impetus given to organizing activities of "outside" unions by the Recovery Act. The evidence shows conclusively that the great majority of the plans were favored and fostered by the companies in order to forestall outside unionization.

In actual operation the plans continued to be used by most of the companies to achieve this objective. As the plans developed, however, there came to be sincere recognition by many executives of the value of the plans for the discovery of workers' grievances and the improvement of labor relations. Also, an aggressiveness developed among employee representatives, and this factor, together with Government suggestion and a measure of success following the outside union's organizing work, led the companies to agree to certain liberalizing amendments. Nevertheless, the amended plans still fell short of the democratic ideal; they still did not function as adequate agencies for collective bargaining between management and men, as that term has commonly been defined by students of labor relations.

III. Inferences Concerning Public Policy

We come now to broad questions of public policy concerning which the conclusions in our study, together with inferences that may be drawn from them, have direct or indirect bearing. I shall consider first the labor problem and then the price problem.

1. The Labor Problem

It has been shown in this study (a) that, for many years up to the Code period, the industry had exercised unilateral control over labor and that that control had been mainly autocratic or paternalistic and frequently harsh and repressive and destructive of those qualities of citizenship that are aspired to in a democracy and (b) that under the Code and in the Code milieu there was definite improvement with respect to labor's right of self-expression and in provisions for settlement of grievances and in the discontinuance of many repressive measures but (c) that there was no essential change in the aim or in the face of one-sided control of labor by the industry.

Liberty of self-expression is so precious and freedom to associate one's self with one's fellows for the purpose of serving mutual interests and participating in decisions affecting those interests is so

elemental that one whose concern is for the public welfare cannot consider these things subject to debate. The problem, however, cannot be disposed of in so simple a manner. So-called "rights" do not in practice exist until they are won. In general it may be said that economic groups secure only those rights which on the basis of their economic strength they can command. Thus, it is unlikely that the steel industry will accord to its workers the right of self-organization unless it is forced to do so by virtue of the workers' own power. It seems to be characteristic of those who wield great power that that power is not shared voluntarily. It is likely, then, in view of the forces set in motion under the National Industrial Recovery Act and under the various Federal labor relations measures, that we shall see bitter struggles for labor organization in the iron and steel industry.

2. The Price Problem

It cannot be too strongly urged that almost any generalization regarding the iron and steel industry will be an oversimplification and therefore erroneous if it is dissociated from the analysis from which it was derived. Examination of the conditions under which



Photo by Republic Steel Corp.

- iron and steel are produced and distributed and a detailed study of pre-Code prices and of filed prices under the Code have shown that we here have to deal with a complicated mixture of monopolistic and competitive forces which may produce somewhat different results at different times. This complexity has its origin not only in the variability of managerial policy but also, and primarily, in fundamental economic conditions.

No seller of tonnage steel products, especially of generally undifferentiated products, can ignore the material influence of his own actions on supply and price. Since the price policy of each seller must be adopted with due regard to its immediate effect on the prices quoted and on the policies followed by his competitors, ordinarily there will be a tendency toward a monopoly price, even in the absence of any agreement among sellers. Imperfect knowledge of the market and uncertainty with respect to the effect of the seller's action on competitors' policies, however, may lead to price competition from time to time, especially during years of depressed demand. A further check on simple monopoly price policies is found in the power inherent in the small number of important buyers in some markets, such as those for automobile sheets. Despite monopolistic tendencies, therefore, in the long-run adjustment of capacity to demand and in the development of new products and processes competitive forces are strong.

If it could be shown that, as a result of this interaction of monopolistic and competitive forces in the iron and steel industry, there had developed a reasonably flexible price structure for all major products; if it could be demonstrated further that price changes approximated, without serious time lags, changes in the marginal costs of these products; then, presumably, there would be no case for Government intervention in this industry. Our analysis suggests that the burden of proof rests upon the industry.

It is a temptation to cut the Gordian knot of discriminations and conflicting interests represented in the existing price structure for steel by enforcing an f.o.b.-mill system of pricing with quoted prices at the mill uniform for all buyers under like conditions. This is the position taken by

the Federal Trade Commission. The logic of this attitude is either (1) that pure competition can be attained in the industry even under its present organization if collusion is prevented by law or (2) that it can be attained by the dissolution of existing corporate entities. This study demonstrates that there is no economic justification for either of these contentions. Our analysis indicates that any standard of fair price defined in terms of equality in the mill net violates the economics of production and distribution of tonnage steel. We conclude, then, that the traditional attitude of the Government, as it has been expressed in the anti-trust laws and by the Federal Trade Commission, is inconsistent with the economics of the steel industry and therefore is in the long run doomed to futility. Some form of basing-point system with the right to absorb transportation to meet competition is required for most tonnage-steel products.

It is, however, not possible on the basis of the analysis contained in this study to formulate a definite program of public policy toward the iron and steel industry. A necessary prelude to intelligent social control or even any rational policy must be knowledge. Throughout this analysis of the economics of the iron and steel industry the authors have labored under the supreme handicap of inadequate data. Available information on such vital problems as costs, actual prices, and distribution are inadequate for definitive analysis. The Federal Trade Commission, under delusions bred of the anti-trust acts, has used its powers to accumulate evidence of "monopolistic" practices rather than to examine the economic conditions under which iron and steel are produced and distributed. The industry itself, secure in its own might, has preferred economic sophistry to the risks of impartial analysis, and, behind a screen of inadequate and noncomparable data, has conducted its affairs in fundamental secrecy.

Under these circumstances it would be without warrant to draw an inference from the conclusions in this study that some sort of Government regulation should be imposed on the iron and steel industry. One cannot recommend Government regulation until one

has first defined the scope of its jurisdiction and evaluated its potential effectiveness to deal with the issues raised in this analysis, and, second, appraised the further problems that regulation itself would occasion. We have shown in this study that the so-called public "supervision" of Code administration by the National Recovery Administration was inadequate even to ascertain, let alone to protect, the interests of minority groups, aggrieved consumers, or the public. But to fashion this negative conclusion into a positive *a priori* formulation of adequate powers and jurisdiction would be to blind one's self alike to the complexities of the industry and to the obstacles that beset the attainment of effective regulation of public utilities in this country—fundamentally a simpler problem. More important, it must be appreciated that the iron and steel industry cannot be considered *in vacuo*. It is highly probable that the economic conditions that have been found to characterize this industry may be approximated or duplicated in many other basic industries. Government regulation in the steel industry cannot be embarked upon intelligently without a consideration of the economic, social, and political implications of the initial step.

By refusing to recommend any one of the alternative forms of Government intervention or supervision, the authors must not be understood as having justified, even implicitly, unfettered private initiative in the industry. All that is maintained is that intelligent policy requires further information and theoretical analysis of the problems involved. This task is clearly beyond the scope of the present study, in part because of the limitations of time and funds but primarily because there are not available, either inside or outside the industry, data adequate for definitive analysis.

The authors have sought throughout the published work to point the issues presented by the problems of the industry and to indicate the data necessary to their analysis. We cannot indulge our preconceptions through prescriptions that carry beyond the limits of the data available to us.

We have recommended, therefore, that a Federal impartial and
(CONCLUDED ON PAGE 86)

The Iron Ores of New Jersey*

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IN the first section of this article, published Feb. 4, the author reviewed the history of iron ore mining in New Jersey, listed the reserves and possible markets of this ore, and discussed the role of Lake Superior and foreign ores in domestic steel production. This concluding section of the article emphasizes the metallurgical value, future markets

and mining costs of Jersey ores. Mr. Roche's thesis is that industry can profit both metallurgically and economically through a greater use of Jersey ores — that these orebodies are as yet practically unexploited, and constitute a valuable national reserve fully worthy of careful consideration by Mid-Western steel makers.

for direct charging into furnaces or for sintering. The beneficiation process employed at Jersey mines is magnetic separation, and the present concentration mills are the result of evolutionary development during the past 25 years. Magnetic concentration has been developed in New Jersey to a low-cost high-recovery process designed for quick change in grade of concentrate and for the production of concentrate with a minimum amount of minus 100-mesh sizes. The new type of magnetic separation mill is so easily controlled that grade of concentrate may be varied from 55 to 70 per cent iron without loss of operating time. Concentrate for direct charging into furnaces is made at 2-in. size and under, and concentrate for sintering is made at 6-mesh size and under.

Table XIII shows the analyses of five grades of concentrate at sizes suitable for sintering or for direct furnace charging. Low-phosphorus concentrate can only be made in the sintering or minus 6-mesh size.

The metallurgical value of iron



THE metallurgical value of iron ores is determined by the iron content, the composition of the gangue, the presence of metallic and of volatile impurities and by the physical characteristics of the ore. New Jersey magnetic crude-ores range from 30 to 60 per cent iron and the gangue is silica, alumina, magnesia and lime. Silica in most ores usually is low, and there is commonly a fair quantity of magnesia and lime present.

Phosphorus is present in all ores, ranging from 1 per cent to as low as 0.005 per cent. Impurities, such as sulphur, chromium, titanium, manganese, nickel, barium, arsenic, lead, zinc and copper are not found in these ores or, if present, are in such small amounts that the value of the ore is not affected. The ore as mined contains from 1 to 3 per cent moisture.

All New Jersey iron ores are beneficiated before shipment to furnaces, and this operation insures uniformity in grade and sizing. All grades of concentrates are made and ores are suitably sized

*A.I.M.E. Contribution No. 105, Class A, Metal Mining; to be presented before the Committee on Eastern Magnetite Mining and Milling Methods, annual meeting American Institute of Mining and Metallurgical Engineers, New York, Feb. 15, 1937.

TABLE XIII

Analyses of Three Grades of Sintering-Size Magnetic-Concentrate
and Two Grades of Direct-Furnace Ore

Element*	Sintering-Ore, Minus 6-Mesh Size			Direct-Furnace Ore, Under 2-In. Size	
	Low- Phosphorus Ore	Bessemer Ore	High- Phosphorus Ore	Bessemer Ore	High- Phosphorus Ore
Iron	67.85	67.11	66.45	66.27	66.96
Phosphorus	0.01	0.04	0.28	0.035	0.50
Silica	1.90	2.40	3.30	2.89	3.11
Alumina	0.90	0.80	1.20	1.04	0.80
Magnesia	1.19	0.60	0.26	0.80	0.18
Lime	0.11	0.18	0.12	0.72	0.11
Sulphur	0.03	0.06	0.06	0.04	0.05
Titanium	0.12	0.22	0.30	0.21	0.29
Manganese	0.08	0.12	0.16	0.11	0.09
Moisture	1.25	1.25	1.25	1.00	1.00

* Chromium, barium, nickel, arsenic, lead, zinc or copper not present.

ores for blast furnace use is determined by three factors, (1) composition of the ore, (2) size preparation and (3) reducibility. New Jersey concentrated ores are equal in grade to the best foreign ores and superior to most. Charles Hart, already cited, has given analyses of 148 foreign ores, and of these only 12 assay 66 per cent iron or over. Jersey beneficiated direct-furnace ores are higher in iron and lower in silica than Lake ores, but are not so easily reduced. This difference in reducibility is, however, offset by the high-iron, low-silica content of the magnetic concentrate. Jersey ores make excellent sinter and in that shape are more easily reduced than Lake ores. Size preparation of ores, either for direct charging into furnaces or for sintering is extremely important. In beneficiation of iron ores, size preparation of concentrate is of as much importance as increasing the iron content and decreasing the silica.

In most beneficiation processes, ores must be sized to accommodate the process, and the size of the final product is governed thereby. In magnetic separation, size of ore treated does not affect the efficiency

of the process and size of concentrate can be closely controlled and is governed almost wholly by furnace requirements. New Jersey ores are much better prepared than foreign or Lake ores and contain less fines (minus 100-mesh) than ores which are sized for direct charging into furnaces or for sintering by simple crushing. The analyses of the concentrate in Table XIII are quite similar, except for the phosphorus content. The sintering-size concentrate was made by wet magnetic separation from crude ores which contained 30 per cent iron. The direct-furnace concentrate was made by a combination of dry and wet magnetic separation from crude ores which contained 40 per cent iron. The similarity in analyses illustrates the efficiency of the modern magnetic separation process. The value of New Jersey concentrated ores is high iron, low silica, low moisture, freedom from injurious elements and excellent size preparation, for either direct-furnace use or for sintering.

New Jersey ores take an all-rail haul to Pittsburgh, and as mining in the State is an all-year operation, ores are delivered to furnaces

regularly in every working day throughout the year. These ores have an advantage in this respect over ores delivered by rail-water-rail routes inasmuch as the ore boats on those hauls are tied up 5 months in the year. Assume that New Jersey and New York were to ship 12,000,000 tons of ore per year to Pittsburgh, that it would require 5 days for the ore to reach its destination and that a working year consists of 300 days. Shipments would then be at the rate of 40,000 tons per working day, and there would be a traveling stock pile of 200,000 tons in transit continuously to furnace ore-yards. If foreign ores were used at Pittsburgh, provision would have to be made for stocking ore during the winter period when ore boats are laid up, an expense not necessary with New Jersey or New York ores.

Future Markets for Jersey Ores

While much interest has been displayed recently in beneficiation of Lake ores, little has been said about the possibilities of low-cost beneficiation of those ores and flue dust at blast-furnace plants in the Pittsburgh area by mixtures with high-grade domestic ores. New Jersey high-iron, low-silica ores may be used to good advantage in this respect. In order to explain this statement, it is necessary to know the cost of Lake and New Jersey ores delivered at blast furnace plants in the Pittsburgh area. An average mining cost must be taken for Lake ore. Table XI shows (see issue of Feb. 4) that the freight rate on Lake ore to Pittsburgh is \$3.02. By taking \$1.45 as the average mining cost, the total delivered cost per ton then becomes \$4.47. The mining cost of \$1.45 is the average of the published cost for all the ranges for a number of years. At a delivered cost of \$4.47 per ton for Lake ore and an average iron content of 49.67 per cent, the delivered cost per unit of iron is 9c. The iron content of 49.67 per cent per ton is assumed in order to illustrate the possibilities of beneficiation of slightly lower grades of ore than are now being shipped. The Pittsburgh delivered price of New Jersey ores is also taken at 9c. per unit of iron, as this is the actual price at which these ores may be delivered. It is on these prices that cost of beneficiating Lake ores and flue dust by mixing with New

TABLE XIV

Classification of Size of Iron Ore Mines in the United States,
According to Their Production in 1930

Classification of Annual Production of Each Mine	Number of Producing Mines	Total Production in 1930, Gross Tons	Per Cent of Production in 1930
From 2,943,016 to 1,000,000 tons.....	13	21,057,310	36.05
From 1,000,000 to 500,000 tons.....	13	8,813,920	15.09
From 500,000 to 250,000 tons.....	40	14,987,390	25.66
From 250,000 to 100,000 tons.....	64	11,421,344	19.56
From 100,000 to 50,000 tons.....	20	1,484,850	2.54
From 50,000 tons.....	58	643,850	1.10
Total.....	208	58,408,664	

Jersey ores at blast furnace plants in Pittsburgh is based.

New Jersey high-iron low-silica ores may be used at Pittsburgh with Lake ores and flue dust as follows: (1) In mixtures with Lake ores, (2) for sintering with Lake ores, (3) as straight sinter mixed with Lake ores, and (4) for sintering with flue dust.

Consider each of these four possibilities: (1) Table XIII shows that New Jersey direct-furnace ore contains between 66 and 67 per cent iron and 3 per cent silica. By mixing 1 ton of this ore with 1 ton of Lake ore assaying 49.67 per cent iron and 9 per cent silica, the mixture will be 2 tons of ore con-

1.31 tons of Lake ore in this case will be the cost of sintering, which will be \$0.0094 per unit of iron in the sinter of 62c. per ton of sinter. Total cost of the 66 per cent iron sinter will be \$0.0994 per unit of iron or \$6.56 per ton. The cost of \$0.0994 per unit of iron in the 66 per cent sinter at Pittsburgh is equivalent to a cost of \$0.08 per unit of iron in ore at Lake Erie ports, or \$4.12 per ton for 51.5 per cent Lake ore.

(3) Straight sinter made of New Jersey ores contains 67 per cent iron, 3 per cent silica and from 0.01 to 0.50 per cent phosphorus. This sinter should serve as an excellent mixer to raise the

sinter 1,981,220 tons of Jersey ore, and the sinter resulting from this operation would be 2,971,830 tons containing 60 per cent iron and 5 per cent silica. The capacity of sinter plants in 1935 in the furnace districts mentioned was 3,300,000 tons.

Assuming that no charge, except for handling, is made for the iron and carbon in the flue dust, then cost of sintering 1.2 tons of flue dust and 2 tons of Jersey ore will be 48c. per ton sinter, or \$0.008 per unit of iron in the sinter. The total cost of iron in the sinter will be \$0.067 per unit plus \$0.008 for sintering cost, or \$0.075 per unit. The cost of \$0.075 per unit of iron

THE Richard Mine,

Wharton, N. J., is capable of producing 100,000 tons of concentrated magnetite ore a year. A subsidiary of the Reading Iron Co., the Thomas Iron Co., originally purchased this 85-acre tract in 1856 for \$32,000, and in the subsequent 81 years of continuous ownership has taken out about 4,000,000 tons of concentrated ore. Currently, the mine's output is being shipped to the Birdsboro, Pa., furnace of E. & G. Brooke Iron Co.



taining 58 per cent iron and 6 per cent silica. The cost of this mixture will be 9c. per unit of iron or \$5.22 per ton at Pittsburgh. By using a high-grade ore, the iron content of the lower grade Lake ore can be raised from 49 to 58 per cent iron and the silica reduced from 9 to 6 per cent. This beneficiation will actually cost nothing, as the delivered price of both ores at Pittsburgh is the same. The cost of 9c. per unit of iron in the 58 per cent ore mixture at Pittsburgh is equivalent to a cost of \$0.068 per unit of iron in ore at Lake Erie ports, or \$3.50 per ton for 51.5 per cent Lake ore.

(2) Lake ore and New Jersey ore may be sintered in the proportion of 1.31 tons of Lake ore at 49.67 per cent iron per ton and 1 ton of New Jersey ore at 67 per cent iron, and 2 tons of sinter will be made which will assay 66 per cent iron. With silica in the Lake ore at 9 per cent and in the New Jersey ore at 3 per cent, the sinter will contain 7.4 per cent. The cost of this sinter will be 9c. per unit of iron, plus the cost of sintering. The cost of beneficiation of the

grade of Lake ores. The cost of this sinter will not exceed \$0.0976 per unit of iron, if sintered with coke breeze at Pittsburgh. The cost of \$0.0976 per unit of iron in the 67 per cent sinter at Pittsburgh is equivalent to a cost of \$0.0785 per unit of iron in ore at Lake Erie ports, or \$4.06 per ton for 51.5 per cent Lake ore.

(4) New Jersey ores may be sintered with flue dust at furnaces in the Pittsburgh area. Table IX (see issue of Feb. 4) shows that the maximum pig iron capacity in Western Pennsylvania, West Virginia and Eastern Ohio is 24,655,160 tons. If furnaces are operated at 60 per cent capacity, the annual pig iron production will be 14,793,096 tons. On the assumption that 180 lb. of flue dust is made per ton of pig iron, there will be 1,188,731 tons of flue dust made per annum. Assume also that the flue dust contains 20 per cent carbon, 40 per cent iron and 10 per cent silica and that it is sintered with New Jersey ore containing 67 per cent iron and 2 per cent silica. The amount of carbon in 1,188,731 tons of flue dust is sufficient to

in the 60 per cent sinter at Pittsburgh is equivalent to a cost of \$0.0537 per unit of iron in ore at Lake Erie ports, or \$2.77 per ton for 51.5 per cent Lake ore. The beneficiation of flue dust by sintering with high-iron low-silica Jersey ores at Pittsburgh furnaces will produce a fairly high-grade sinter at low cost.

Magnetites, because of lower moisture content, better size preparation and higher iron content, are sintered at a lower cost than Lake ores. Only one-half of the fuel used to sinter Lake ores is required to sinter Jersey ores. Sintering cost of magnetites at Eastern furnace plants with fuel is 50c., and with flue dust (free carbon) is 44c. per ton sinter, including equipment royalty. Sintering cost of Lake ores at mines averages \$1.32, at interior furnace plants with fuel 74c., and with flue dust (free carbon) 61c. per ton of sinter.¹⁴

The computed cost per ton of beneficiated ore mixtures through

¹⁴ Perry G. Harrison, "Sintering Economics," Transactions of American Institute of Mining and Metallurgical Engineers, 1932, Vol. 100, pages 57-63.

the use of New Jersey high-iron ores and high-iron sinter at furnaces in the Pittsburgh area is under the published cost of Lake ores delivered at Lake Erie ports. The computed cost per ton of 60 per cent sinter made from New Jersey ores and flue dust is much less than the cost of Lake ores.

Benefits derived from such beneficiation through higher iron and lower silica in ore burdens and through reclamation of flue dust cannot be estimated here. If the annual requirement of blast furnaces in Western Pennsylvania, West Virginia and eastern Ohio is 30,000,000 tons of 52 per cent iron-10 per cent silica Lake ore, and if one-third of this tonnage was replaced by 10,000,000 tons of 67 per cent iron-3 per cent silica Eastern magnetic concentrate, the average iron-silica per ton of such mixture would be 57 per cent iron and 7.7 per cent silica. In this way, Lake ores may be beneficiated without increase in cost per unit of iron delivered at Pittsburgh and without large capital expenditures for beneficiation plants at Lake mines.

Mining Cost of Jersey Ore

In the past, New Jersey iron mines have not received the attention they deserved because of their tie-up with Eastern merchant furnaces. Mines owned by merchant furnaces were operated intermittently and production was held to requirements of one or two small furnaces. No attempt was made to work mines at a production rate in proportion to the size of the orebodies. As a consequence, costs were high, the orebodies were considered to be small and not capable of sustaining large production. For instance, shipments from one mine in the Dover district for many years averaged 100,000 tons, although the orebodies were large enough for a continuous output of 500,000 tons, and the magnetic concentrating mill had a capacity of 400,000 tons annually. If this mine had been operated at maximum output, operating costs would have been reduced \$1 per ton and it would have been ranked as one of the 25 largest iron mines in the United States. The neck of the bottle in New Jersey iron-ore mining has been ownership and operation by small merchant furnaces.

Total cost of mining and beneficiation of Jersey magnetites is 5c. per unit of iron in the concen-

trate. The cost of beneficiation is 20c. per ton of crude ore, and recoveries of 98 to 99 per cent of the iron is attained. These costs are based on continuous operation at maximum output. Freight on ore from Jersey to Pittsburgh, from Table XII (see issue of Feb. 4), is \$0.0376 per unit of iron. With a 5c. mining cost and a 3.76c. freight cost per unit of iron, the delivered cost at Pittsburgh would be 8.76c. per unit of iron in the ore. There is, however, no profit included in this figure. New Jersey orebodies are comparatively narrow, but the ore is hard and the walls are firm, thereby requiring no timbering. The ore is mined by high shrinkage stopes and 98 per cent of the ore is recovered. While these orebodies have been called small, they are of sufficient size to sustain production at 250,000 to 400,000 tons per year. Table XIV is a classification of the iron ore mines in the United States, according to productive capacity. The table shows that only 26 mines in the United States produce over 500,000 tons per annum and that 122 mines out of the total of 208 mines produce under 250,000 tons. About 51 per cent of the production comes from 26 large mines and 49 per cent comes from 182 small mines. There are many orebodies in New Jersey, if mined at a rate of extraction justified by their size, that would produce over 300,000 tons per year.

While New Jersey magnetic iron orebodies are small in comparison with some of the foreign ore deposits, they can be mined, the ore prepared for furnace use and delivered at a cost under the delivered price of the best foreign ores. New Jersey ores have a higher mining cost than some of the foreign ores, but have a decided advantage in lower freight cost. No matter how foreign ores reach the Pittsburgh area, whether by rail from Atlantic ports or through the proposed St. Lawrence Waterway, high freight rates will operate against them. Many of the New Jersey orebodies are so located that ores from them may be treated in a centrally located beneficiation plant. Mining adjacent orebodies at the rate of 1,000,000 tons or more per year and by beneficiation in a common magnetic separation mill, the cost of concentrate will be reduced from 5c. to 4c. per unit of iron in the concentrate.

The estimated reserve tonnage of direct-shipping ore of the Lake

Superior iron ranges is 1,500,000,000 tons of hematite with an average iron content of 50 per cent. The estimate of reserve tonnage of New Jersey iron ores is 600,000,000 tons of magnetite with an iron content of 40 to 60 per cent. Various estimates have been made of the non-titaniferous iron ore reserves of New York, and an average of these estimates is 900,000,000 tons of magnetite with an iron content of 40 to 60 per cent. The total reserve of New Jersey and New York is 1,500,000,000 tons of magnetite, which is amenable to low-cost beneficiation in the ratio of 1.5 tons of 45 per cent crude ore to 1 ton of 67 per cent concentrate. The reserves of New Jersey and New York, by such concentration, will yield 1,000,000,000 tons of 67 per cent concentrate. The combined tonnage of the Lake Superior and New Jersey-New York reserves is 2,500,000,000 tons of ore with an average iron content of 57 per cent. If consumption is at the rate of 50,000,000 tons yearly, the life of this reserve is 50 years. Before depletion of this reserve, the low grade reserves of 72,000,000 tons of Lake ore will become available through low-cost high-recovery beneficiation processes.

Foreign ores are considered by some writers as high-iron low-silica ores, free from injurious elements, of good structure and well prepared for furnace use. Shipments of foreign ores to this country range from 48 to 70 per cent iron and from 2 to 18 per cent silica. The average of these shipments is 55 per cent iron and 10 per cent silica. Some of these ores contain undesirable elements such as arsenic, chromium, lead, copper, zinc, sulphur and high phosphorus. The structure of much of the foreign ores is poor, and it is badly prepared for market. None of it is as easily reduced as Lake ore. In mining, either underground or in open-pits, dilution of ore with rock can not be avoided, and such dilution lowers the grade of ore from 5 to as much as 20 per cent. The Swedish magnetite deposits at Kiirunavaara are estimated at 740,000,000 tons of ore containing 58 to 70 per cent iron and 0.045 to 4.50 per cent phosphorus. Most of this ore is mined in open-pits and dilution by wall rock is a serious matter. In mining this ore, 30.27 tons of ore and 28.8 tons of

rock are broken per foot of hole drilled.¹⁵

Kiiruna ore is beneficiated by hand cobbing, and shipping grade ore from the main orebody averages 58 to 60 per cent iron and 0.80 to 4.50 phosphorus. Wabana ore, from Newfoundland, is a red hematite and contains as shipped 50 per cent iron and 0.90 per cent phosphorus. Reserves are placed at 3,500,000,00 tons. It is evident that Swedish ore from the main deposit at Kiirunavaara and Wabana ore from Newfoundland can not be used to any extent with Lake ore, because of their high phosphorus content and, in the case

Sweden and Norway, are hematites and, so far, low-cost high-recovery beneficiation processes for such ores have not been worked out, either here or abroad. For magnetites, however, the magnetic separation process has been highly developed, and these ores may be beneficiated to any degree. Beneficiation of iron ore results in a product that is uniform in grade and size, higher in iron and lower in silica than ores which are prepared for market by crushing and hand cobbing.

None of the foreign ores shipped to this country is as high in iron as New Jersey and New York bene-

the center of transportation for shipping finished and semi-finished products, without recourse to foreign ore, through the use of domestic beneficiated ore.

Supporters of the St. Lawrence Waterway contend that large imports of iron ore are necessary for the continued operation of American blast furnaces because of depletion of Lake Superior ore reserves. They also argue that domestic ores should be conserved for emergency needs. At the same time they urge the export of coal in large quantities, as a backhaul on boats which would bring foreign ore to Lake Erie ports. The United

THE Scrub Oak mine of Alan Wood Steel Co., at Dover, N. J., is currently producing about 25,000 tons of concentrates a month, assaying about 68.50 per cent iron from 60,000 to 65,000 tons of crude ore. The Scrub Oak vein is approximately 30 ft. thick, contains about 30 to 32 per cent Fe and dips at 55 deg. S.E. Its longitudinal dimensions have not yet been fully developed.



of Wabana ore, low iron content. Chilean hematite deposits are reported to contain over 67 per cent iron, but assays of shipments show only 62 per cent iron. Sampling of the Brazilian hematite ores showed 67 to 69 per cent iron, but dilution by mining may reduce this to 62 per cent. The amount of dilution cannot be determined in advance of actual mining operations. However, Brazilian ore, because of low phosphorus and silica content, should be a good mixer with Lake ores, although high freight cost will probably limit its use at Pittsburgh.

With the exception of some Swedish and Norwegian ores, none of the foreign ore shipped to this country is beneficiated ore. Most foreign ores are prepared for market by simple crushing which, in a few cases, is followed by hand cobbing. Foreign ores, with the exception of the magnetites of

ficiated ores, except Swedish and Norwegian magnetic concentrate. Because of their high-iron low-silica content, freedom from injurious elements and better size preparation, Eastern magnetic concentrate will be found to be superior to foreign ores as mixers with Lake ores. Eastern beneficiated magnetic ore is from 5 to 18 per cent higher in iron than foreign crude ores.

It has been shown that New Jersey high-iron low-silica ore can be delivered at Pittsburgh at a cost comparable to the present published price of Lake ores. With the reserve of Eastern magnetic ores to draw on, Lake Erie iron industries will have an ample supply of domestic ore to supplement Lake ore, and they will not be compelled to use high-priced foreign ore for such purpose. Despite the fears of advocates of the St. Lawrence Waterway, these industries can maintain their position as the center of transportation costs for fuel, ore and fluxes and

States has 42 per cent of the iron ore reserves and 50 per cent of the coal reserves of the world. Why the iron ore reserves of this country should be conserved and the coal reserves depleted is not clear. If conservation of iron ore is important, then finished products such as pig iron and steel should be imported so that coal and other raw materials would also be preserved. Considering the reserves of iron ore and coal of the United States, there appears to be no good reason why domestic ores should be conserved or that coal should not be exported. On the other hand, instead of conserving iron ore and depending upon supplies from foreign mines, which would be cut off in event of war abroad, domestic reserves should be developed as part of a program for national defense. Development and operation of domestic iron ore mines would give employment to many men, which is of vital importance at the present time.

¹⁵ B. H. Strom, "Swedish Iron Ore: Mining and Transport," *Engineering and Mining Journal*, 1930, Vol. 130, pages 381-386.

Self-Powered Mobile Handling



THE methods and equipment of industrial materials handling may be roughly classified under four general heads: (1) Hoists and cranes, including all types of overhead trackage and trolley-suspended carriers, (2) Conveyors, including chutes, slides and elevators, (3) Suction or blower systems, and (4) Wheeled vehicles. The first three named may be termed "fixed" systems, since their range of operation is limited by the means of applying power, or by the physical construction of the equipment or essential parts thereof. Only the fourth category possesses the factor of complete, independent mobility. It is this factor which sets apart the fourth class of equipment from all the rest, and demands for it a radically different treatment of all the problems of industrial materials handling for which it is suited.

The earliest industrial wheeled vehicle was undoubtedly the humble wheelbarrow—still in use. Two, three and four wheeled hand-carts followed, then the familiar two wheeled baggage type hand-truck, the skid-platform hand-truck, and various types of hand-lift trucks. A century or more ago a special development branched off along one particular line, and today this is known as the "industrial railway," for in this development, wagons equipped with flanged wheels are pushed or pulled along rails fixed to the ground. This development may be put aside for detailed ex-

THE development of the self-powered truck and tractor train has added a new conception to the theories of industrial materials handling. To the fundamental ideas of *lifting* and *shifting*, this line of equipment has added the characteristic of *independent mobility*, thus widening the ranges of application indefinitely. This is the third in a series of articles on the subject of materials handling. The first appeared Dec. 10, 1936, and the second Feb. 4, 1937.

amination later, since the main purpose of the present discussion is concerned with the completely independent mobile wheeled units known as industrial trucks and tractors.

The application of self-contained power units to wheeled industrial vehicles marks an epochal development in the history of materials handling equipment, for it gave to equipment already mobile, complete independence of action. Then, for the first time, loads too heavy to be moved by man-power could be moved anywhere completely independent of any outside source of power. The only limitation was a floor or platform smooth enough to travel over easily.

The first industrial trucks were designed for *shifting* loads only; but it was not long before they were adapted first to pick up the loads they were designed to shift, and then to serve equally as lifting

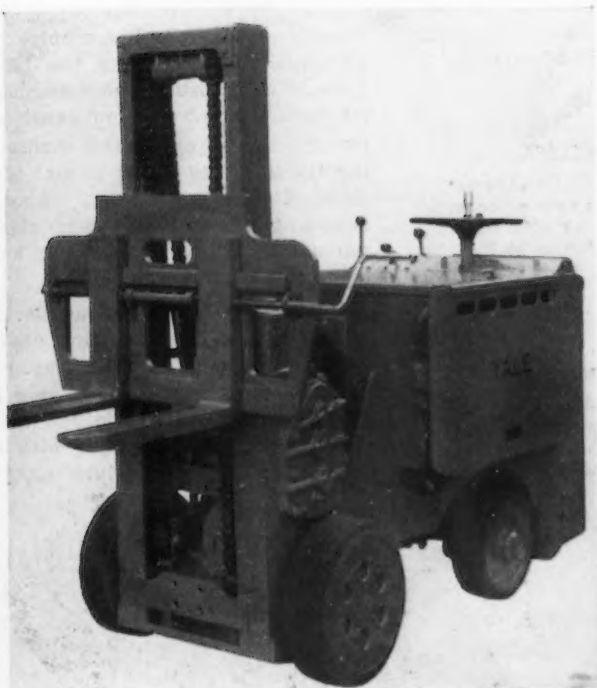
and shifting mechanisms. Today the variety of special types of trucks which have been designed for combination purposes is literally legion. The earliest types of trucks had the high, narrow platform still seen in railroad baggage trucks. Next in order was the drop platform truck, designed for easier loading, with the platform close to the floor. An adaptation of this type, with controls at both ends and the dropped platform in between, may be seen in baggage service at railroad terminals even today. In all these types the platform is fixed and the load must be lifted onto the truck.

In Fig. 1 is shown an early lift type truck, designed to be run under loaded skid platforms, lift them up off the floor and carry them away. This is a Yale truck of the vintage of about 1922. About the same time cranes were installed on truck bodies, with the mast mounted at the control station and the boom swinging over the platform. This arrangement enabled awkward or bulky shapes to be picked up intact, without boxing, and to be moved while carried by the crane. Such an arrangement made it possible to spot heavy parts accurately at equipment where machining operations were to be carried on. Likewise dump bodies of side-dump or end-dump types were mounted onto low platform trucks to facilitate the handling of loose or bulk materials.

But many industrial operations of a special nature could not suc-

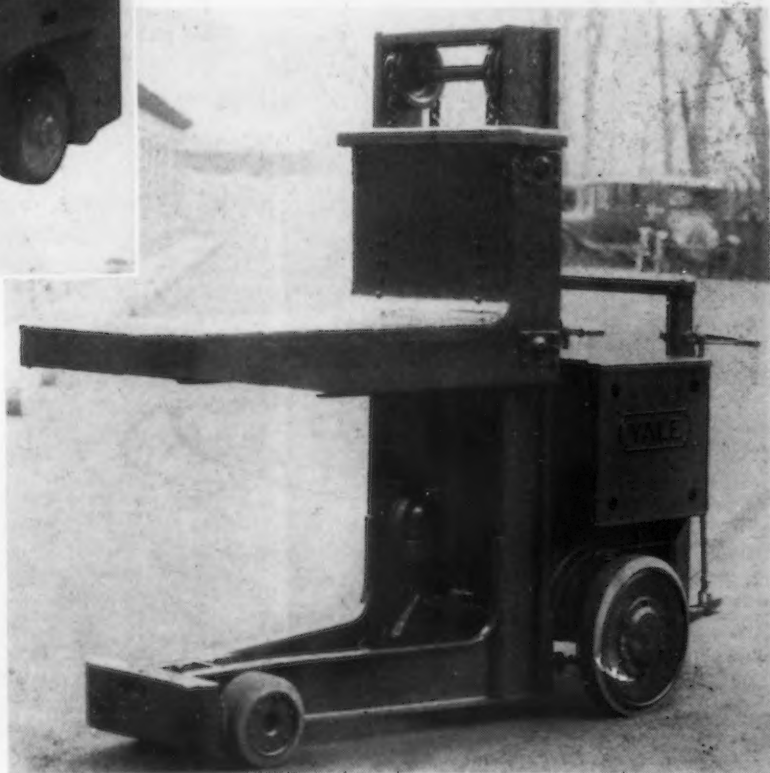
Equipment

By FRANCIS JURASCHEK
Consulting Editor



AT LEFT
FIG. 2—Yale high lift fork truck for picking up and carrying pigs of metal.

BELOW
FIG. 1—One of the early Yale lift platform electric trucks (about 1922)



cessfully be handled either by the lift platform or the crane type of truck, and in the effort to solve these special problems, attention was turned away from the platform of the truck to the control station as a point onto which lifting equipment could be built. Having completely re-oriented their thinking in this respect, designing engineers quickly produced the fork truck to handle tin plate, the tiering truck to stack materials in layers, the ram truck to pick up heavy rolls or coils of material, and the shovel truck to pick up bulk mate-

rial. And from this point on, the special adaptations of industrial truck operations have increased by leaps and bounds.

While these developments were taking place, the tractor-train was following a different line. Instead of seeking to monopolize three-quarters or more of all materials handling functions in one piece of equipment, the tractor has largely stuck to its original purpose of being a locomotive-without-rails,

and has hauled its complements of trailers in long strings ever further and more rapidly. Although the storage battery powered tractor has had the greater preference for these uses, its gas-engine powered brother has not been far behind. In both types extreme flexibility of movement, or "maneuverability" has been the constant aim of the builders, until today the stunts which can be performed with tractor-trains are little short of marvelous.

In the tractor-trailer system, the motive power unit is kept entirely separate from the load-carrying vehicles. The power is used for *pulling* loads instead of *carrying* them. Thus the motive unit can be used continuously, never standing idle while loads are being put on or taken off, and materials movements can be systematized into regular trains, moving on established time schedules; trailers being cut off and left anywhere for loading and unloading. In brief,

it utilizes the principles of railroad freight traffic, without the limitations of a fixed trackage system.

Analysis of Operations

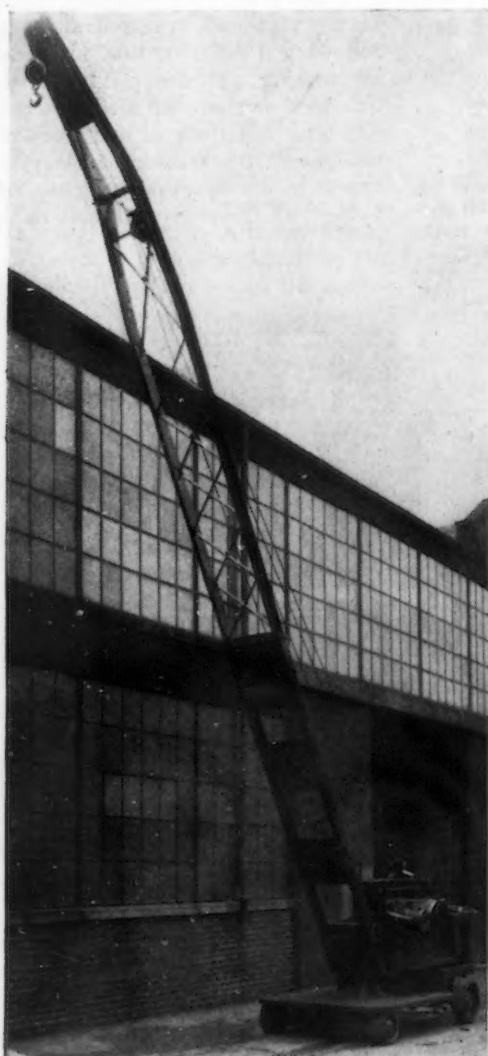
In studying the possibilities of using industrial trucks or tractor-trains in any particular plant, attention must first be given to limitations. The first and most obvious requirement for successful operation is that of a fairly smooth floor over which the vehicles can be run. This may be concrete, asphalt, wood plank, wood-block or smooth stone-block, or even hard-packed clay where it is protected from the weather. This floor should not be slippery, especially where turns must be made. There are two reasons for the requirement of a fairly smooth and not slippery floor; (1) There must be traction, or grip of the wheels on the surface, and (2) The relatively low power of the vehicle must be conserved for useful work rather than for toiling over corduroy-like roadways.

The second requirement is for clear aisles or passageways along the floors, at least 50 per cent wider than the maximum vehicle width on straightaways, and of ample width to permit easy turns at bends, obstructions or corners. Consider that, in one sense, these vehicles are like automobiles; they must have clear roadways to fulfill their purposes adequately.

The third requirement is that these aisles or roadways (or open spaces) be level. While it is true that industrial trucks and tractor-trains will travel up ramps with gradients as high as three per cent or more, they are designed to carry full loads only on the level. Industrial trucks can be run onto freight elevators to reach floors at different levels, but they should not be expected to run up or down long ramps to reach these other floors by means of their own power.

A fourth requirement (applying to storage battery vehicles only) is a means of recharging the batteries. This is usually accomplished by installing a charging panel in the vehicle "garage" and connecting the batteries to the line at the close of each day's work, without removing them from their compartments. Thus the batteries are kept up to par continuously.

With these broad limitations in mind the materials handling problems of an entire plant may be considered as a unit in applying a system of self-powered mobile handling equipment. Starting with a production flow chart laid out to



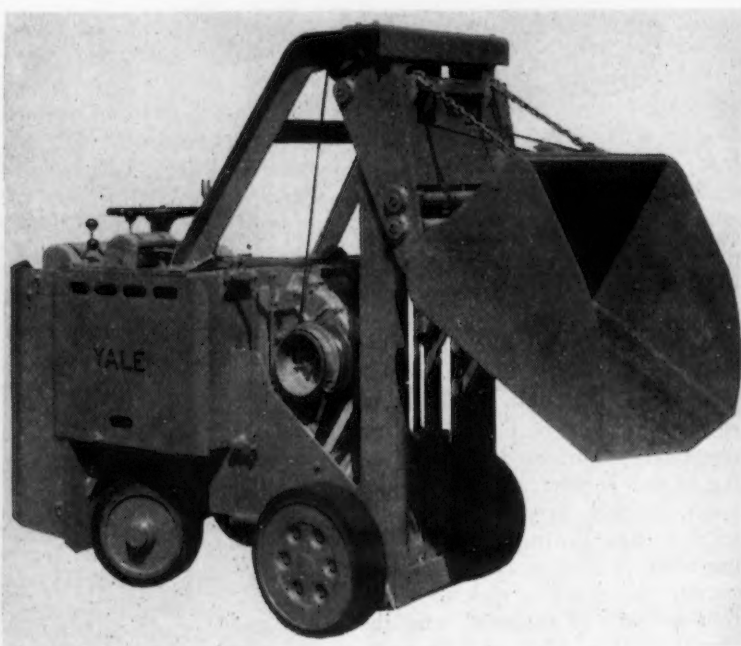
AT LEFT

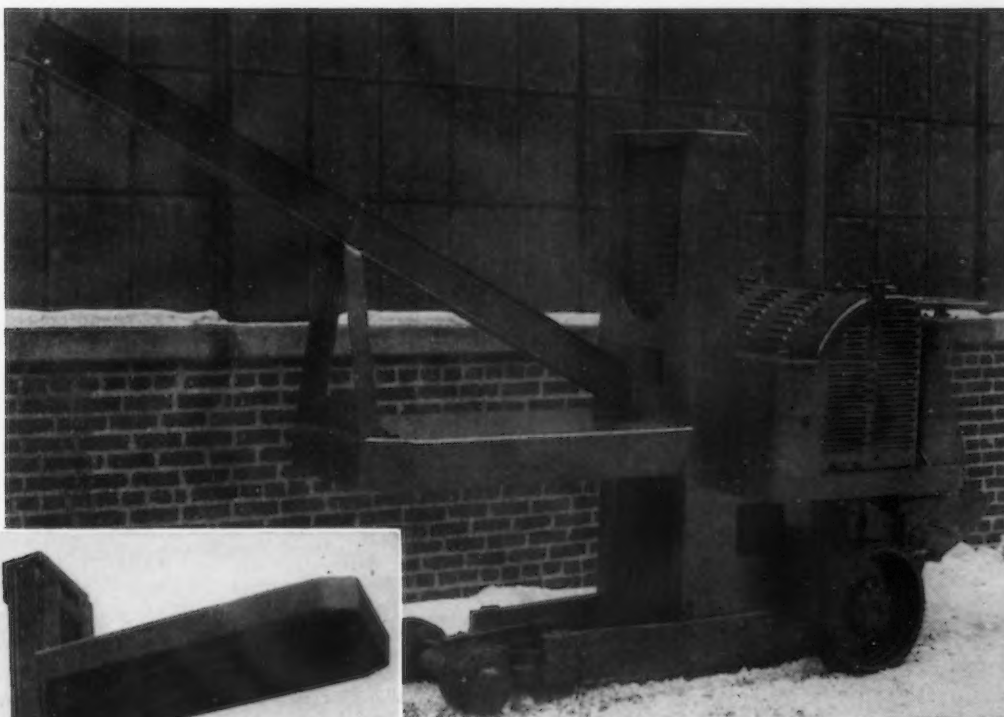
FIG. 4—Elwell-Parker telescoping boom crane truck with boom extended to 30 ft.

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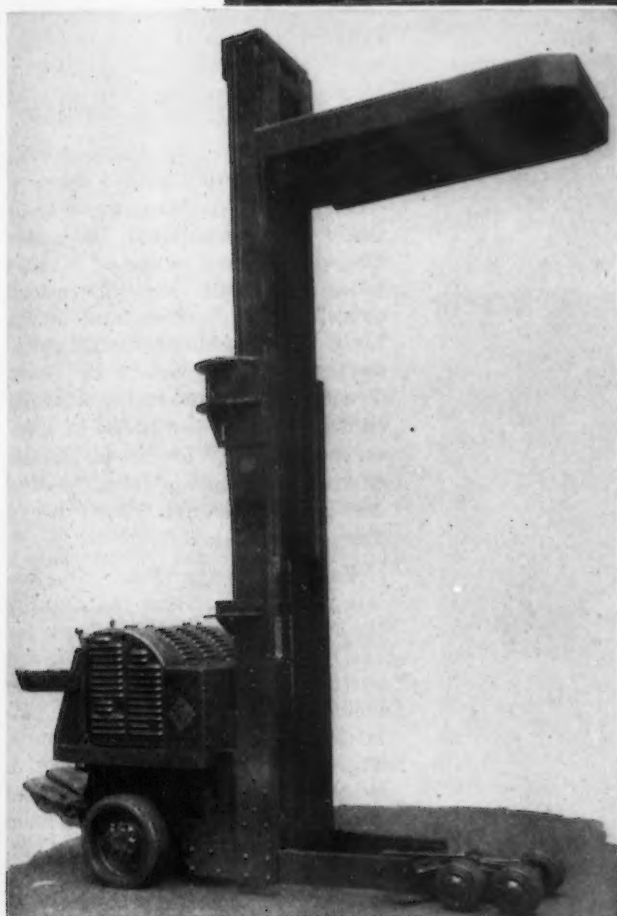
BELOW

FIG. 3—This Yale dumping-shovel scoop truck will pick up 15 cu. ft. at a bite.





ABOVE
FIG. 5—Special crane attachment for standard elevating platform Elwell-Parker truck.



AT LEFT
FIG. 6—5-ton Elwell-Parker telescoping elevating platform truck for skid handling.

scale, with whole floors and their contents of machines and equipment plotted thereon, movements of material should be traced from point to point, and analyses of loads, time of movement, distances, and methods of handling, made section by section. Such a study will amply repay the time and effort involved, whether the question be one of adapting a handling system to existing layouts, of changing existing layouts to secure better production, or of planning a com-

pletely new set-up. Modern low-cost production springs from careful planning and the coordination of every step in a process. No greater source of waste and inefficiency exists than the haphazard setting up and later uncoordinated growth of an industrial operation.

Intelligent Application

The most complete advantages to be obtained from any system of materials handling depend not

alone upon the resulting substitution of mechanical devices for human muscle, for this substitution may be made to the point where *all* handling is mechanical and automatic and yet production costs will be too high. Common sense must be used, and the twin ideals of a flow of production moving continuously in one straight, uninterrupted line, with the utmost economy of motion at each point along that line, held to as consistently as may be possible and practicable.

Not the number of men who can be displaced by mechanical devices, but the ease, rapidity and all-around low-cost with which a minimum number of men can turn out a maximum quantity of saleable product—this is the criterion by which the value of materials handling equipment and methods must be judged. Manifestly it is not so good a solution of a production problem to install devices that enable seven men to produce the same amount of product as ten men now turn out, as the solution which permits the original ten men to double their present output, or to halve their present unit costs.

The outstanding advantages of industrial trucks and tractor-trains spring from the fact that they are self-contained, self-powered, mobile units. They are free to move anywhere. They are not tied to any sort of fixed installations of tracks,

overhead rails, or of such structures as are required for conveying systems. Given passage-ways or open spaces, they are rapid, capable of remarkable flexibility of movement, and, as made today, dependable. It is a mistake, however, to think that they take the place of other forms of materials handling

make their consideration in any particular problem a matter of easy comparison and logical study.

Today's Equipment

A description of the various units available today is a matter of covering principally the unusual



FIG. 7 — Elwell-Parker tiering, tilting telescoping fork truck equipped with apron to handle rolls up to 40 in. diameter by 114 in. long.

equipment. Certain functions overlap to a large degree, but the main lines of services are fairly clear-cut, and in any given case where two or more types of equipment seem to be equally adapted, a complete analysis of all service factors will usually indicate a correct solution of the problem. It is the purpose of these articles to present detailed descriptions of the advantages and limitations of all types of materials handling methods and equipment in such a manner as to

special adaptations of fundamental equipment. No attempt will be made to do this completely, for it would require a hundred page catalogue simply to list the main points of all the units. A description of a few of the most unusual items, however, will indicate the wide range of vehicles for special purposes now being built. In between these odd types and the fundamental units may be found almost everything which the imagination cares to dwell upon.

For instance, within the past two years, Automatic Transportation Co. has built an elevator low-lift truck of 60,000 lbs. capacity, with eight rubber-tired wheels each 15 in. x 17 in., and a platform 40 in. wide by 96 in. long, especially to handle heavy automobile body forming dies.

In the Annual Review issue of *THE IRON AGE* several newer units were described, notably a new line of gasoline-engine powered 3, 4 and 5 ton elevating platform trucks by the Baker-Raulang Co., a Mercury Mfg. Co. ram truck for handling coils of strip steel, a Mercury storage battery tractor of all-welded steel boiler plate construction, a Mercury tractor with a Ford 4-cylinder industrial engine as the power plant, and a Mercury tilting, tiering fork truck to carry loads of tin plate up to 4000 lb.

Among other developments not described in that article were a small gasoline-engine power tractor made by International Harvester Co. with a speed range of 2 to 10 miles per hour and dimensions overall of 96 in. long and 50 in. high; a line of three small 6 cylinder gas engine tractors by Clark Tractor Co. producing a pound of drawbar pull per pound of tractor weight; and an Elwell-Parker Electric Co. gas-powered tiering fork truck designed to lift heavy loads on pallets.

Yale & Towne Mfg. Co. has lately been successful in adapting the fork type of high lift truck for use in handling pigs of metal, and at the same time retaining all the general utility features of the pallet handling system. As shown in Fig. 2, the forks are designed to grip the pigs firmly and safely, and can be laterally adjusted by a hand crank to handle any size of pig. The sharp, bevelled inside edges of the forks enable them to support the pigs by actually biting into the underside curvature of the protruding lip or ear. This truck has a maximum capacity of 4,000 lb. and is built to turn around in an aisle only 6 in. wider than the total length of the truck and load.

The Yale & Towne dumping shovel scoop truck illustrated in Fig. 3 is capable of digging into a pile of sand, glass batch, coal or other miscellaneous loose material, picking up from 10 to 15 cu. ft. at one time for transportation, and dumping the load at any height within the range of the lift, in

keeping with operating requirements. The design of this complete unit is such that it may be maneuvered in close quarters, as in a freight car, with speed and flexibility.

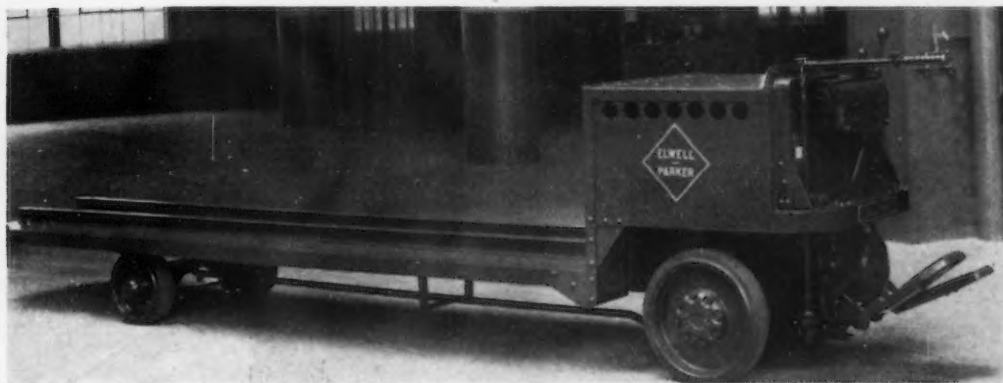
Two very interesting new types of crane trucks are recent products of Elwell-Parker Electric Co. In Fig. 4 is shown the telescoping boom crane with a reach extending

storage capacity by 50 per cent. The truck is 118 in. overall and has a maximum lift of 164 in. Safety features in the hoist unit include a friction clutch (elevating) and ratchet (lowering) in the event that the platform should strike an obstruction while either elevating or lowering loads.

A very special piece of equipment with a wide range of usefulness is

so that the barrels can be rolled off the truck directly onto the storage platform, and vice versa. One truck handles four to five barrels, depending upon the length of the platform. The trail end of the truck is carried on semi-elliptical leaf springs.

Illustrating the adaptability of the small gasoline-powered tractor to pull "trackless trains" on fast,



AT LEFT

FIG. 8—2-ton special platform Elwell-Parker truck with removable rails, as built for handling barrels at steamship docks.

o o o

BELOW

FIG. 9—A typical Mercury gas-powered tractor and trailer train.

from 19 ft. 6 in. to 30 ft. This telescoping boom is of the motor slew type, and can be turned through 210 deg. The hoist and topping unit is driven by a single motor clutch for throwing the drive to either drum. Such equipment as this gives the industrial user many of the advantages of a light locomotive crane, combined with the flexibility of movement of the industrial truck.

In Fig. 5 is shown the second Elwell-Parker new crane truck development. This is simply a special crane attachment for application to standard elevating platform trucks. Although the boom cannot be slewed, it makes a very handy arrangement where irregular shaped or bulky objects are to be handled. With this equipment railroad cars can be loaded or unloaded from the track level, eliminating the need for a shipping platform. The truck illustrated is a 2 wheel drive, 4 wheel steer, standard model.

Elevating platform trucks seem to have no lift limitations at all these days. Fig. 6 shows an Elwell-Parker telescoping type elevating platform truck with a capacity of 10,000 lbs., built to handle baled wood pulp on skids. With this equipment the user can pile loads three high instead of two high as heretofore, thus increasing his



the Elwell-Parker tiering, tilting, telescoping fork truck shown in Fig. 7. This truck as shown handles rolls 40 in. in diameter by 114 in. long. The apron is quickly interchangeable with standard forks. The truck is 2 wheel drive and 2 wheel steer, and the arrangement of lifting chains permits maximum vision ahead for the operator.

In Fig. 8 is shown an Elwell-Parker special, 4,000 lb. platform truck with two removable rails for handling rosin barrels. In the Southern port where most of this rosin is received, the storage docks are the same height as the truck,

regular schedules is the view of a Mercury Mfg. Co. unit shown in Fig. 9. The trailers, equipped with corrugated metal bodies, may be filled at leisure, and picked up by the tractor-train as it makes its regular rounds. A Mercury electric storage battery tractor adapted for identical uses, was illustrated in the Annual Review issue of *THE IRON AGE*, January 7.

Fig. 10 illustrates one of the many heavy duties to which a gasoline-powered tractor crane may be assigned in an industrial plant. Flexibility of movement of the tractor and the crane unit enables such equipment to perform rapidly,



FIG. 10—Special tractor cranes are adapted to many heavy industrial handling jobs.

easily and at low cost hundreds of odd handling jobs which formerly required a great deal of man power.

The illustrations accompanying this article are merely suggestive of the wide range of special adaptations of equipment now available. New types of equipment are being

designed and built every day. The equipment manufacturers are always willing to discuss the possibility of designing new models to fit any needs which present types do not completely cover. This attitude has been responsible for the many advances made in recent

years in self-contained mobile handling technique.

(The next article in this series will treat of hand trucks and hand-operated lift trucks, with examples of their use in the general scheme of materials handling.)

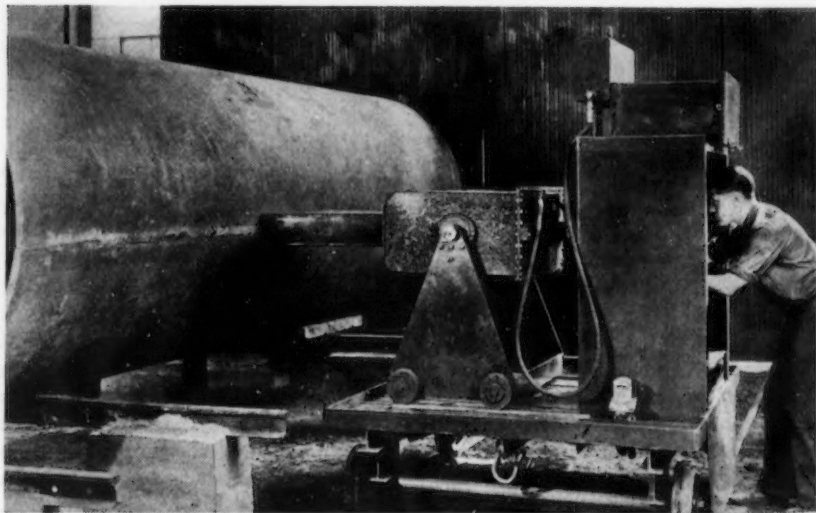
Locomotive Boiler Has Welded Barrel and Dome

WHAT is believed to be the first high-pressure boiler ever made with welded barrel and dome, under U-68 (class I) rules of the A.S.M.E. code for fusion welded vessels, was recently completed by Farrar & Trefts, Inc., Buffalo, N. Y.

The boiler is of locomotive type and is for use in the oil fields. The barrel, shown in the illustration, is 16½ ft. long, 62½ in. in outside diameter and is made of 1.15 in. thick steel plate, electrically welded by the shielded arc process. Welded construction of the barrel eliminated a large amount of calking of seams, and in remaining permanently tight, the welded

seams assure freedom from maintenance. The two longitudinal welds of the barrel were hammer tested at 575 lb. and leak tested at

700 lb. hydrostatic pressure. Welding was done with Lincoln Electric equipment, using "Fleetweld 6" electrodes.



World's Largest Telescope Mounting An Outstanding Welded Structure

THE mounting for the optical system of the 200-in. telescope that is to be erected on Mt. Palomar may well be regarded as the outstanding arc welded structure of the past year, according to C. H. Jennings in charge of welding research at the Westinghouse Research Laboratories. Being fabricated at the South Philadelphia works of the Westinghouse Electric & Mfg. Co., this structure is remarkable not only because of its size but also because of the accuracy with which it must be fabricated and machined. The permissible error in sighting must not be greater than the angle formed by two lines three miles long subtending an arc equivalent to the thickness of a 25-cent piece.

structure is plainly indicated by the manikin shown at the bottom of the model.

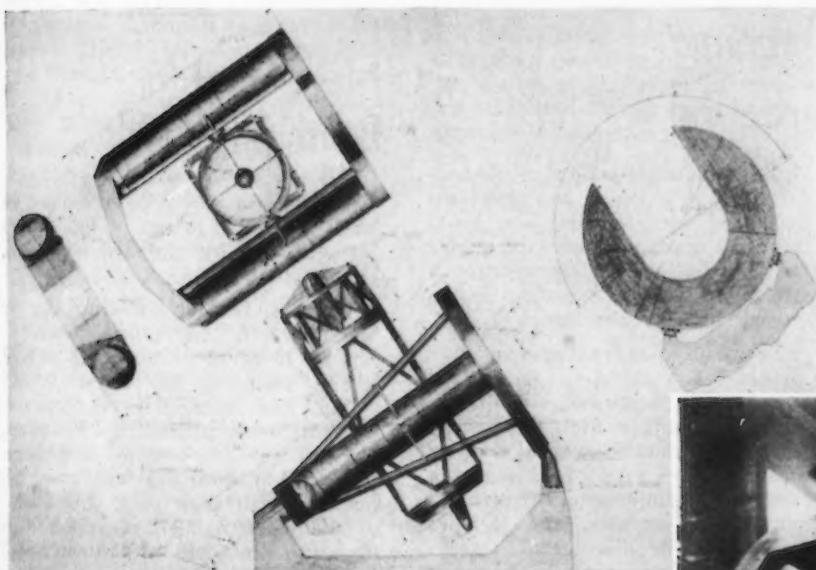
The telescope mounting is composed essentially of two units: the tube, and the yoke in which the tube swings on a set of flexible gimbals. The tube, which is 60 ft. long and 22 ft. in diameter, supports the 200-in. reflecting mirror and contains compartments to house the prime focus and auxiliary mirrors and the observer. One of the illustrations herewith shows welders working on the top ring section of the tube.

One end of the yoke consists of a giant bearing having the shape of a horse shoe. This bearing is 46 ft. in diameter and 4 ft. 2 in.

thick. The opposite end of the yoke is a flat swivel 46 ft. long, 10½ ft. deep and 5 ft. wide which turns on a ball and socket bearing that is floated on oil. The ends of the yoke are joined together by two hollow tubes 60 ft. long and 10½ ft. in diameter.

The polar-axis horse shoe will weigh 350,000 lb. and is the most difficult section of the entire structure to fabricate. It is essential that the distortion resulting from welding be held to less than ½ in. on the 46-ft. diameter in order that it may be properly machined. This requirement necessitates the development of a special welding procedure and the careful control and supervision of all welding.

All sections of the weld fabricated mounting are to be carefully strain annealed in specially constructed furnaces to completely relieve all welding stresses. This procedure is essential to insure that the structure will remain absolutely accurate throughout its entire service life.



AT LEFT

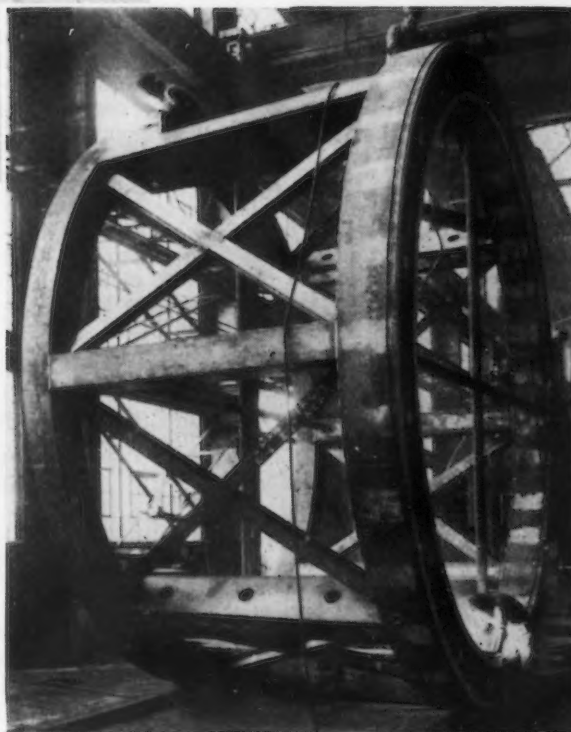
THIS weld-fabricated mounting for the optical system of the 200-in. telescope to be erected at Mt. Palomar is remarkable not only for size but for the accuracy with which it must be built and machined. Distortion resulting from welding of the 350,000-lb. polar-axis horse shoe, for example, has to be held to less than ½ in. on the 46-ft. diameter.

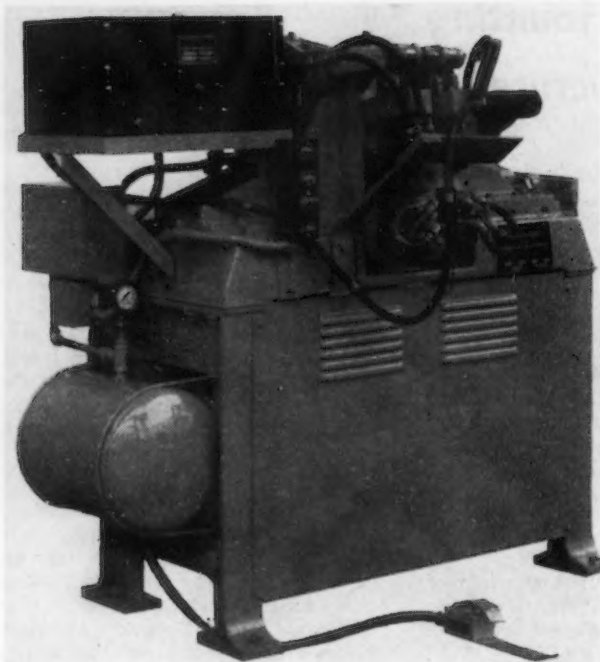
Although the complete telescope mounting will weigh more than 1,000,000 lb. it must be constructed so that it can be controlled and turned smoothly in order that it may be sighted and held with absolute accuracy on any desired object. Because of the accuracy and smoothness required in the operation of the telescope, welded construction was adopted, thereby making possible large savings in weight without loss in rigidity.

The 1/32 scale celluloid model built to study the design and rigidity of the telescope mounting was shown in THE IRON AGE of Jan. 7, page 580. The immense size of the

AT RIGHT

WELDING the prime focus ring of the 200-in. telescope mounting at the South Philadelphia works of the Westinghouse Electric & Mfg. Co. This ring is 22 ft. in diameter and 12 ft. high.





CLOSE, predetermined temperature control in heat-treating operations is obtained by electronic devices. The machine is the Federal electric resistance heater.

Electric Resistance Machine Adapted for Heat Treating

ELECTRIC resistance heating is made applicable for heat treating operations in the manufacture of high carbon tools and various other products in new heating machines developed by the Federal Machine & Welder Co., Warren, Ohio.

These machines have many features similar to resistance welders. An advantage emphasized is that they permit close temperature control so that exact and uniform temper or hardness may be obtained. With the use of the finer grades of high-carbon steel and alloys it is often found necessary to work to much closer temperature limits than formerly in order to secure the temper or hardness called for. The predetermined degree of heat required is controlled within very close limits by photoelectric cells and a delicate timing device made by the Electronic Control Corp.

After being set up for a particular job the heater operates automatically and the heated pieces drop by gravity into a quenching tank, containing water, oil or hot lead, as required.

Several of these machines have been built for annealing, tempering or hardening such articles as motor valve stems, cutters, reamers, drills, and wearing pins and are said to have a production rate higher than with the use of other methods and to produce work that has the ad-

vantage of practically absolute uniformity. A machine has also been developed for soldering and brazing. As common grades of solder melt at quite low temperature a still finer electronic control is required than for heating steel.

The chief advantages of this method of heating, it is pointed out, are its cheapness, cleanliness, uniformity and a high production rate. The electric current flowing uniformly through the work causes uniform heating throughout, eliminating stresses, and it does not oxidize or discolor the work. The surface structure of the work is not changed, as there is no flame containing sulphur or other impurities to be absorbed by the hot metal.

Welding Rods of "Compensating" Type

A "COMPENSATING" welding rod—an evenly tapered rod designed to assure maximum deposition as the heat of the arc or torch increases—has been announced by the Electric Arc Cutting & Welding Co., 152 Jelliff Avenue, Newark, N. J.

With the smaller diameter at the starting end, more metal is deposited at the beginning than with welding wire of uniform diameter,

and the new rod is also said to compensate for the current resistance loss in that part of the rod still to be deposited. In addition to fast starting with the pointed end, there is said to be no stub-end wastage due to the large end of the even diameter rod being too hot to permit continuing the welding. Higher current densities are possible if the work can stand being speeded up, with savings corresponding to the increase in speed. With the higher current densities better grain structure is obtainable, so that not only improved welding results, but jobs hitherto impossible can be done, it is stated. Corner and deep vee work is possible with the quick starting end of the compensating rod. Less voltage, and hence less power, is required, especially in starting.

These compensating rods are available in all types, namely, bare, fluxed, dipped, and extruded, and in all sizes. A number of distributors will be appointed by the company.

New Bond for Polishing Wheels

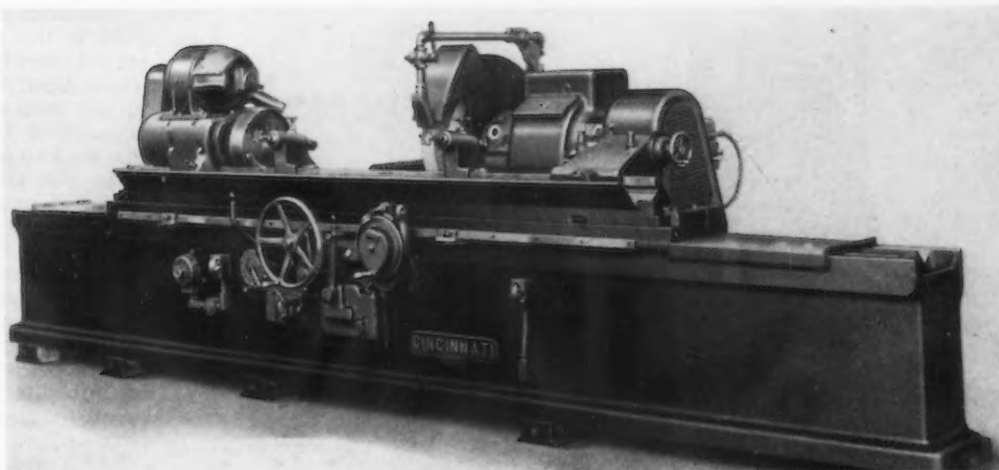
FOR setting up polishing wheels and belts a new type of adhesive bond named Flexogrip has been brought out by the Udylyte Co., Detroit.

Features include non-chipping or breaking off, the material becoming an integral part of the wheel grain, resulting in longer wheel "head" life. Flexogrip requires no thinner, being applied as received. Its low surface tension and high penetrating qualities are said to permit it to seep into the fibers of the wheel or belt material and also into the pores of the abrasive grain. Furthermore, the new abrasive bond hardens rapidly under heat. This makes possible a speeding up of wheel-setting, and through the friction heat generated in operation, causes the material to become brittle and fracture into small areas, thus continually exposing fresh cutting edges to the work.

Less tendency of the Flexogrip-treated wheel to crowd or fill up when polishing soft metals is also emphasized, as well as a minimizing of wheel glaze and prevention of wheel burns that streak or discolor the work.

Flexogrip is furnished in two types, namely a type A for grains coarser than No. 80 and a type B for grains finer than No. 80 and up to and including FF grade abrasives.

NEW Cincinnati plain self-contained cylindrical grinder available in 14 and 16-in. sizes, with between-center lengths ranging from 18 to 168 in.



Cylindrical Grinder Designed for Accurate Work with High Finish

FOR the economical production of high-grade finishes and continuous duplication of very accurate limits, the Cincinnati Milling Machine and Cincinnati Grinders, Inc., Cincinnati, is offering a new plain self-contained grinding machine with capacities for work 14 and 16 in. in diameter. Standard between-center lengths ranging from 18 to 168 in. are available for each size.

The wheel-head spindle is mounted in radial and thrust bearings of new design. The radial bearings are "load compensating," being equally effective for heavy and light cuts without the necessity of adjusting from the one to the other. A plain thrust bearing supported by a cradle type mounting is located midway between the ends of the spindle. This design permits the spindle to be reciprocated by means of a hydraulic device if reciprocation of the wheel is desired.

Lubrication of the bearings is automatic. Clean oil is circulated under a light pressure by an individual pump. Even before the spindle starts to rotate, normal lubrication is assured by means of a pressure starting switch which will not permit the main motor to start until the bearings are flooded with oil. Conversely, the main drive motor stops automatically as soon as the oil-pump motor is stopped. Other parts in the wheel-head unit, including its ways on the machine bed, are lubricated by a one-shot system.

Main drive motors larger than 20 hp. are mounted on the floor; those of 20 hp. or less, directly on top of the unit. Outboard mount-

ing of the driven sheave facilitates replacement of the V-belts.

The headstock or work driving unit has a new type of drive, similar to that of the larger roll grinding machines. Power is transmitted through V-belts from the motor to the driven sheave, and thence through silent chain to the jack-shaft and faceplate. This unit is independently driven from a d.c. adjustable-speed motor mounted on top of the casting. Lubrication is automatic.

Twenty-four work speeds, ranging from 40 to 160 r.p.m., for the 14-in. size, and 25 to 100 for the

16-in. machine, are obtained from a rheostat adjustment.

Lubrication of table ways is a feature. A gear pump draws oil from a reservoir in the machine base and forces it past a low-pressure relief valve to the table ways, the oil being filtered en route. Diamond shaped grooves on the under side of the table distribute the oil evenly from reservoirs at the ends of the bed, the oil drains back to the main reservoir.

The table is driven separately by a motor which drives the coolant pump and the change-gear unit from which the various table feeds are obtained. This motor is connected to the main drive motor, circuit; therefore the same switch controls both motors.

The net weights of the machines range from 11,500 to 27,500 lb..

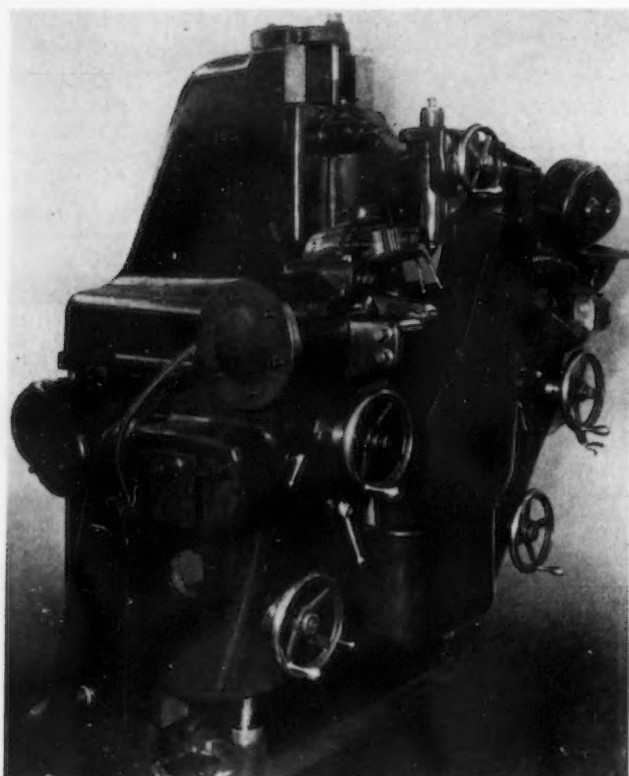
Millwright's Truck

A SMALL millwright's or electrician's truck equipped with pneumatic tires is being offered by the Saginaw Stamping & Tool Co., Saginaw, Mich. Welded steel construction is used throughout and Timken roller bearings are applied to the wheels. In the particular unit pictured, the tray measures 40 x 20 in. and is 12 in. above the floor. Ten-in. pneumatic wheels are employed. The design can be varied within a wide range of dimensions, depending upon the size of tires used.

Besides being quiet in operation,

the pneumatic tires subject floors to practically no abuse. They are particularly useful in drawing such a truck over highly polished floors in office buildings.





• • •
TWO - CUTTER
 rotary type
 gear finisher fea-
 turing flexibility
 of set-up for
 short runs.
 • • •

Gear Finisher Features Flexibility

TO meet gear finishing requirements of manufacturers not having sufficiently long production runs to take full advantage of the rack-type of Michigan gear finisher, a new two-cutter, crossed-axis, rotary machine has been designed by Michigan Tool Co., Detroit.

The machine offers the smaller gear producer or one faced with the problem of producing a large variety of only a few gears each, lower initial machine and tooling costs. The sturdy construction permits fast cutting with maximum accuracy by minimizing deflection.

In this duplex finisher the gears are mounted between centers and are passed between two crossed-axis cutters toward the rear of the machine during the working stroke.

A feature of the machine is that the two cutters can be used independently to finish simultaneously two gears of different characteristics in a cluster or both right- and left-hand sides of a herringbone gear, thus eliminating duplicate machines and reducing loading and cutting time in half. This is made possible by making the two cutters separately adjustable as to height, position with reference to axis of gears, and amount of crossed axis setting.

This crossed-axis setting results, as in the rack-type machine, in creating a sliding action lengthwise

of the teeth as the cutter and work are rotated with the cutter and work teeth in mesh. Graduations in degrees are provided on the cutter carrying heads for adjustment of amount of crossed axis desired, or measuring pins may be furnished for this setting.

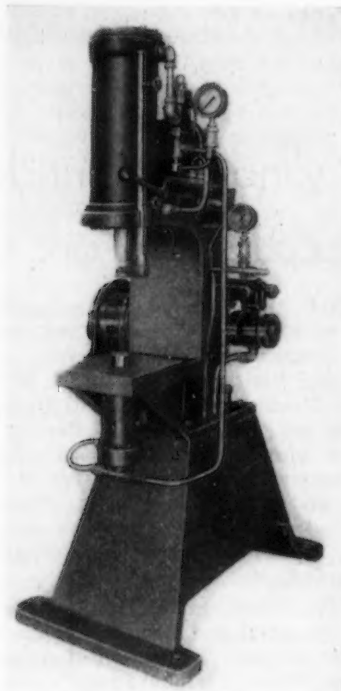
At the time of loading the work into the machine, the work carrying centers are toward the operator with respect to the cutters. Feed is obtained by moving the work carrying head away from the operator toward the rear of the machine, the work thus passing through the cutters. It will be apparent that when the center of the work is in line with the centers of the cutters that the gear will be finished to size.

Feed of the work back and forth through the cutters is by individual motor drive through reduction gears or rapid return may be obtained by provision of separate motor drive, so that working or return stroke speeds can be readily varied by changing pick-off gears.

Hydraulic Press Has Top and Bottom Rams

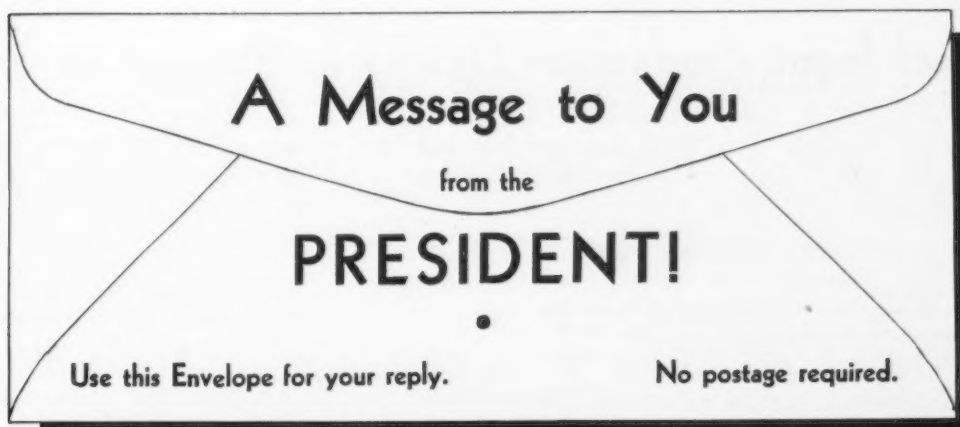
USE of an additional ram that operates through the work table and in conjunction with the top ram is the special feature of a new Greenerd hydraulic press, the W60, built by the Greenerd Arbor Press Co., Nashua, N. H., for assembling, clamping and riveting.

Operation of both rams is complete in the one cycle. When the control lever is tripped, the top ram comes down to the work, exerting 90 per cent of the predetermined pressure of 1½ to 10 tons. Then the bottom ram automatically comes into action with an upward stroke of approximately one-third the pressure exerted by the top ram, and as soon as it reaches the work maximum pressure is exerted by both rams. The maximum pressure is maintained evenly until the lever is released, and may be held on the work indefinitely without injury to the press.



The machine is equipped with a stop rod that regulates the length of travel of the top ram in either direction; and the top ram has an automatic or manual reverse. A 3-hp. motor and hydraulic pump are mounted on opposite sides of the main housing and the pump is connected between a 20-gal. sump in the base and a pair of hydraulic valves. Top and bottom pistons are made of steel with cast-iron piston rings and sealed with chevron type packings with bleeder pipe to take up seepage. The press is equipped with two hydraulic gages.

The top ram has a down-stroke pressure of 10 tons and an up-stroke pressure of 8 tons. Its stroke adjustable from 1 to 16 in. The bottom ram has a stroke of 1½ in. At no load, the top ram travel on the down and up stroke is 116 and 148 in. per min., respectively; with a 2 to 6-ton load the down stroke travel of the ram is 113 in. per min.; and with a 6 to 10-ton load it is 33 in. per min.



Respectfully Called to the Attention of President Roosevelt and Postmaster General Farley

ON this page we reproduce circular material that is being distributed to workers for the purpose of persuading them to enroll in the steel workers' union, which is a part of the John Lewis outfit.

Note that the envelope accompanying the circular is designed to give the recipient the impression that he is receiving a suggestion or request from the President of the United States.

Note, too, that the headline of the circular says: "The President wants you to join the Union!"

May we ask if this crass and disingenuous propaganda is not both misrepresentation of the President and also fraudulent use of the mails?

E. G. BUDD Workers Know Your Rights!

The President wants you to Join the Union.

The National Labor Relations Board, official U. S. Government agency created by the last session of Congress, has the legal power to hold an election in your plant, to let the workers decide for themselves which organization shall serve as their collective bargaining agency.

This is how the 11,000 General Electric workers in Schenectady, N. Y. defeated the fake company union and instead voted themselves into the United Electrical and Radio Workers and gained recognition from one of the most powerful employers in America. You, too, can do likewise.

The Steel Workers Organizing Committee just wrested the first 10 percent wage increase from the Steel Corporations in years, which started a train of wage rises throughout America. This is how you came to get yours.

But there is more where this came from. And you are entitled to more.

Your employer is compelled by Federal law to recognize your union as soon as a majority in your plant votes for it. Your employer is also forbidden by law to fire you for union activity. Even the most powerful U. S. Steel Corporation no longer dares fire workers for union activity. They have learned their lesson.

Backed by the most powerful unions in America, you elected a President of the United States. Now the Committee for Industrial Organization, of which John L. Lewis is Chairman, is helping you elect yourselves a Steel Workers Industrial Union.

How to get it:

- 1) Fill out the attached Application Blank. Seal in attached envelope. Drop in nearest mail box. No postage required.
- 2) As soon as a majority of you mail these in, the Union will demand that the National Labor Relations Board hold an election in your plant. Your employer will then be compelled to recognize your union.

One Big Industrial Union for All Workers in the Steel and Wire Industry

Sign this Application Now.
Tomorrow may be too late.

Don't wait for the other fellow.
Do it today. Hundreds have already done it.

NO INITIATION FEE

Here's How!

1. Fill out this Application.
2. Tear out carefully.
3. Seal and mail in attached envelope.

No postage required.

Only the Union has your vote.

The employer cannot reach you.

You have nothing to fear.

This is YOUR Declaration of Independence.

DO IT NOW!

AMALGAMATED ASSOCIATION OF IRON, STEEL
AND TIN WORKERS OF NORTH AMERICA
(Steel Workers Organizing Committee)
3600 GRANT BUILDING : PITTSBURGH, PA.

E. J. LEVER, Field Director
Philadelphia, Pa.

Date _____ 19____

I hereby accept membership in the Amalgamated Association of Iron, Steel & Tin Workers of North America, through the Steel Workers Organizing Committee, and of my own free will hereby authorize the Steel Workers Organizing Committee, its agents or representatives to act for me as a collective bargaining agency in all matters pertaining to rates of pay, wages, hours of employment, or other conditions of employment.

Employed by _____ (Name of Company) _____ (Department)

If not working check ☐ Name _____

Address _____

City _____

Steel Ingot Production Figures as Revised to Weekly

THE American Iron and Steel Institute, which has discontinued the daily AGE, Feb. 11, p. 94), has revised all production figures back to the begin

MONTHLY PRODUCTION OF STEEL INGOTS

(Gross Tons)

Includes open-hearth, bessemer, crucible and electric ingots from January to December, 1926. Open-hearth and bessemer ingots only in January, 1927, and subsequent months.

WEEKLY PRODUCTION CALCULATED ON THE FOLLOWING BASIS OF NUMBER OF WEEKS IN MONTHS

	Normal Year	Leap Year
January	4.43	4.43
February	4.00	4.14
March	4.43	4.43
April	4.29	4.29
May	4.43	4.43
June	4.29	4.29
July	4.42	4.42
August	4.43	4.43
September	4.28	4.28
October	4.43	4.43
November	4.29	4.29
December	4.42	4.42
Total	52.14	52.28

	1926 Calculated Monthly Production	Calculated Weekly Production	Per Cent of Operations
January	4,132,210	932,779	87.09
February	3,785,051	946,263	88.35
March	4,468,617	1,008,717	94.18
April	4,105,799	957,063	89.36
May	3,927,979	886,677	82.79
June	3,734,153	870,432	81.27
July	3,634,993	822,397	76.78
August	3,986,966	899,992	84.03
September	3,913,383	914,342	85.37
October	4,074,544	919,762	85.88
November	3,705,744	863,810	80.65
December	3,466,766	784,336	73.23
Total	46,936,205	900,196	84.05

Percentages of capacity operated are calculated on weekly capacities of 1,071,040 gross tons; based on annual capacities as of Dec. 31, 1925, as follows: Open-hearth, bessemer, crucible and electric ingots, 55,844,033 gross tons.

OPEN-HEARTH AND BESSEMER STEEL INGOTS ONLY BEGINNING JAN. 1, 1927

	1927 Calculated Monthly Production	Calculated Weekly Production	Per Cent of Operations
January	3,789,874	855,502	77.94
February	3,812,046	953,012	86.82
March	4,535,272	1,023,763	93.27
April	4,127,335	962,083	87.65
May	4,047,251	913,601	83.23
June	3,495,609	814,827	74.24
July	3,204,135	724,917	66.04
August	3,498,549	789,740	71.95
September	3,268,881	763,757	69.58
October	3,316,292	748,599	68.20
November	3,127,015	728,908	66.41
December	3,175,484	718,435	65.45
Total	43,397,743	832,331	75.83

Percentages of capacity operated are calculated on weekly capacities of 1,097,629 gross tons; based on annual capacities as of Dec. 31, 1926, as follows: Open-hearth and bessemer ingots, 57,230,350 gross tons.

	1928 Calculated Monthly Production	Calculated Weekly Production	Per Cent of Operations
January	3,990,902	900,881	80.33
February	4,043,457	976,680	87.09
March	4,507,217	1,017,430	90.73
April	4,305,382	1,003,586	89.49
May	4,207,212	949,709	84.69
June	3,743,903	872,705	77.82
July	3,865,598	860,995	76.78
August	4,178,610	943,253	84.11
September	4,147,893	969,134	86.42
October	4,649,968	1,049,654	93.60
November	4,266,835	994,600	88.69
December	4,018,208	909,097	81.07
Total	49,865,185	953,810	85.05

Percentages of capacity operated are calculated on weekly capacities of 1,121,421 gross tons; based on annual capacities as of Dec. 31, 1927, as follows: Open-hearth and bessemer ingots, 58,627,910 gross tons.

	1929 Calculated Monthly Production	Calculated Weekly Production	Per Cent of Operations
January	4,500,131	1,015,831	86.84
February	4,328,713	1,082,178	92.51
March	5,068,176	1,144,058	97.80
April	4,950,053	1,153,859	98.64
May	5,286,246	1,193,284	102.01
June	4,902,955	1,142,880	97.70
July	4,850,583	1,097,417	93.82
August	4,939,086	1,114,918	95.31
September	4,527,887	1,057,918	90.44
October	4,534,326	1,023,550	87.50
November	3,521,111	820,772	70.17
December	2,903,012	656,790	56.15
Total	54,312,279	1,041,662	89.05

Percentages of capacity operated are calculated on weekly capacities of 1,169,751 gross tons; based on annual capacities as of Dec. 31, 1928, as follows: Open-hearth and bessemer ingots, 60,990,810 gross tons.

	1930 Calculated Monthly Production	Calculated Weekly Production	Per Cent of Operations
January	3,778,235	852,875	71.42
February	4,035,111	1,008,778	84.47
March	4,254,331	960,346	80.42
April	4,109,492	957,924	80.21
May	3,982,915	899,078	75.29
June	3,418,535	796,861	66.73
July	2,922,220	661,136	55.36
August	3,060,763	690,917	57.86
September	2,840,379	663,640	55.57
October	2,692,539	607,797	50.90
November	2,212,220	515,669	43.18
December	1,979,547	447,861	37.50
Total	39,286,287	753,477	63.09

Percentages of capacity operated are calculated on weekly capacities of 1,194,202 gross tons; based on annual capacities as of Dec. 31, 1929, as follows: Open-hearth and bessemer ingots, 62,265,670 gross tons.

Averages by American Iron and Steel Institute

average of ingot production beginning with January this year (THE IRON AGE) on a weekly average basis. The new calculations are given below:

	1931 Calculated Monthly Production	Calculated Weekly Production	Per Cent of Operations
January	2,512,140	567,074	44.75
February	2,547,027	636,757	50.25
March	3,054,339	689,467	54.41
April	2,766,959	644,979	50.90
May	2,551,633	575,989	45.46
June	2,127,762	495,982	39.14
July	1,887,580	427,054	33.70
August	1,716,829	387,546	30.58
September	1,545,411	361,077	28.50
October	1,590,180	358,957	28.33
November	1,591,644	371,013	29.28
December	1,301,211	294,392	23.23
Total	25,192,715	483,174	38.13

Percentages of capacity operated are calculated on weekly capacities of 1,267,157 gross tons; based on annual capacities as of Dec. 31, 1930, as follows: Open-hearth and bessemer ingots, 66,069,570 gross tons.

	1932 Calculated Monthly Production	Calculated Weekly Production	Per Cent of Operations
January	1,484,991	335,212	25.97
February	1,481,253	357,791	27.72
March	1,433,337	323,552	25.07
April	1,259,629	293,620	22.75
May	1,125,243	254,005	19.68
June	912,757	212,764	16.45
July	806,722	182,516	14.14
August	846,730	191,135	14.81
September	991,858	231,743	17.96
October	1,087,058	245,386	19.01
November	1,032,221	240,611	18.64
December	861,034	194,804	15.09
Total	13,322,833	254,836	19.75

Percentages of capacity operated are calculated on weekly capacities of 1,290,620 gross tons; based on annual capacities as of Dec. 31, 1931, as follows: Open-hearth and bessemer ingots, 67,473,630 gross tons.

	1933 Calculated Monthly Production	Calculated Weekly Production	Per Cent of Operations
January	1,016,870	229,542	17.76
February	1,073,012	268,253	20.76
March	898,236	202,762	15.69
April	1,345,422	313,618	24.27
May	1,976,428	446,146	34.52
June	2,564,420	597,767	46.25
July	3,168,354	716,822	55.46
August	2,863,569	646,404	50.02
September	2,283,079	533,430	41.27
October	2,084,894	470,631	36.42
November	1,521,189	354,590	27.44
December	1,798,666	406,924	31.49
Total	22,594,079	433,335	33.53

Percentages of capacity operated are calculated on weekly capacities of 1,292,408 gross tons; based on annual capacities as of Dec. 31, 1932, as follows: Open-hearth and bessemer ingots, 67,386,120 gross tons.

	1934 Calculated Monthly Production	Calculated Weekly Production	Per Cent of Operations
January	1,997,129	450,819	34.33
February	2,211,944	552,986	42.10
March	2,798,440	631,702	48.10
April	2,936,064	684,397	52.11
May	3,399,494	767,380	58.43
June	3,059,483	713,166	54.30
July	1,489,453	336,980	25.66
August	1,381,350	311,817	23.74
September	1,268,977	296,490	22.57
October	1,481,902	334,515	25.47
November	1,610,625	375,437	28.59
December	1,964,257	444,402	33.84
Total	25,599,118	490,969	37.38

Percentages of capacity operated are calculated on weekly capacities of 1,313,364 gross tons; based on annual capacities as of Dec. 31, 1933, as follows: Open-hearth and bessemer ingots, 68,478,813 gross tons.

	1935 Calculated Monthly Production	Calculated Weekly Production	Per Cent of Operations
January	2,870,161	647,892	49.06
February	2,774,271	693,568	52.52
March	2,865,292	646,793	48.98
April	2,640,602	615,525	46.61
May	2,633,661	594,506	45.02
June	2,258,664	526,495	39.87
July	2,267,827	513,083	38.86
August	2,915,930	658,223	49.85
September	2,825,004	660,048	49.99
October	3,142,759	709,426	53.72
November	3,150,409	734,361	55.61
December	3,073,405	695,340	52.66
Total	33,417,985	640,928	48.54

Percentages of capacity operated are calculated on weekly capacities of 1,320,478 gross tons; based on annual capacities as of Dec. 31, 1934, as follows: Open-hearth and bessemer ingots, 68,849,717 gross tons.

	1936 Calculated Monthly Production	Calculated Weekly Production	Per Cent of Operations
January	3,045,946	687,572	52.50
February	2,964,418	716,043	54.67
March	3,342,619	754,542	57.61
April	3,942,254	918,940	70.16
May	4,046,253	913,375	69.73
June	3,984,845	928,868	70.92
July	3,922,731	887,496	67.76
August	4,195,130	946,982	72.30
September	4,161,108	972,221	74.23
October	4,545,001	1,025,960	78.33
November	4,337,412	1,011,052	77.19
December	4,431,645	1,002,635	76.55
Total	46,919,362	897,463	68.52

Percentages of capacity operated are calculated on weekly capacities of 1,309,784 gross tons; based on annual capacities as of Dec. 31, 1935, as follows: Open-hearth and bessemer ingots, 68,475,509 gross tons.

THIS WEEK ON THE ASSEMBLY LINE



... General Motors-UAW agreement provides face saving for both, although Lewis loses point of sole bargaining agency except on conditional basis.

o o o

... Corporation aims at peak production of 225,000 units in March as plants resume operations upon evacuation by sit-downers.

o o o

... Automobile and rubber tire companies announce pay increases of 5c. to 8c. an hr., as annual reports show large 1936 profits.

o o o

... Increase in car prices not foreseen immediately as makers fear restriction of market.

DETROIT, Feb. 16.—Consensus of opinion in Detroit seems to be that the present settlement of the General Motors strike represents a whitewash for both sides. Governor Murphy, after eight days of constant effort, was finally able to announce at an early hour last Thursday that an agreement had been reached. The agreement represents some very nice hair-splitting in meaning of words, and both sides were enabled to do some face saving. General Motors executives took pains to point out that, in the agreement signed with the union, recognition of the UAW as the sole bargaining agency was not granted even for a matter of six months. In a sepa-

rate letter addressed to the Governor, a promise was made that the corporation would not manufacture a counter-move and that, if within a period of six months from the date of resumption of work any other union or representatives of employees approached the corporation to discuss matters of general corporation policy, no bargaining or agreement with such groups would be undertaken without first gaining the sanction of Governor Murphy. It is only when the issues raised conflict with the demands made by the union in its letter of Jan. 4, that such action will be taken. It is obvious that any matters of purely local jurisdiction, involving perhaps only a single de-

partment in one plant, will be discussed by the local management with local groups without prejudice to the negotiations being carried on in Detroit with the UAW and the CIO.

Although a spirit of amity seemed to prevail between the principals in the dispute, when the agreement was signed, bitterness continued to show itself in Anderson, Ind., where rioting broke out early Saturday morning between union and non-union men and necessitated the declaration of martial law. Probable cause is the great preponderance of non-union men, who resent being bound to the terms of the agreement signed with the UAW, simply because Guide Lamp Division was a "struck" plant.

Collective Bargaining Almost the Only Issue

Although the sit-downers left the Flint plants in a triumphal parade, it is evident to most impartial observers that Mr. Lewis had to climb down from his untenable position of demanding that his group be recognized as the sole bargaining agency. Mr. Green of the A. F. of L. took pains to point this out the day after the agreement was signed. And it is now quite evident that during the hectic eight days and nights in which General Motors executives and Mr. Lewis were exchanging notes by way of Governor Murphy, the entire argument revolved around this single topic, although it is admitted that the discussions covered a wide range of territory, but always came back to this primary point. The record to date shows that in no case has the



UAW or any other CIO union been able to force this particular demand upon management. In view of this fact and also the fact that both Governor Murphy and President Roosevelt were not only privy to, but had an actual hand in dictating the terms of settlement, the Government is placed in a position where in an important test case it nullifies the spirit of the Wagner Labor Relations Act. The costly battle which has just taken place should prove to fair-minded persons that the exclusion of minority groups in industrial relations problems is a false premise. Even though a "packed" Supreme Court should sustain the constitutionality of the Wagner Act, an amendment to this act seems to be in order if industrial peace is to be preserved.

When the settlement of Feb. 11 is examined it is found that negotiations are brought back to where they had been at the Lansing agreement effected on Jan. 15. Then it was that a plan was reached whereby seven points would be negotiated the following Monday, Jan. 18. Of those points, the only one on which definite action has been taken has been this all-important question of sole recognition. On Tuesday, Mr. Knudsen, his assistant, C. E. Wilson, and Harry W. Anderson, director of industrial relations, began bargaining with officers of the UAW and with representatives of the CIO, John Brophy and Lee Pressman. Pressman, incidentally, was one of the signers of the Jan. 11 agreement. Points to be discussed include the adoption of a 30-hr. week, establishment of minimum rates of pay, presumably of 80c. an hr. in Michigan, seniority rights

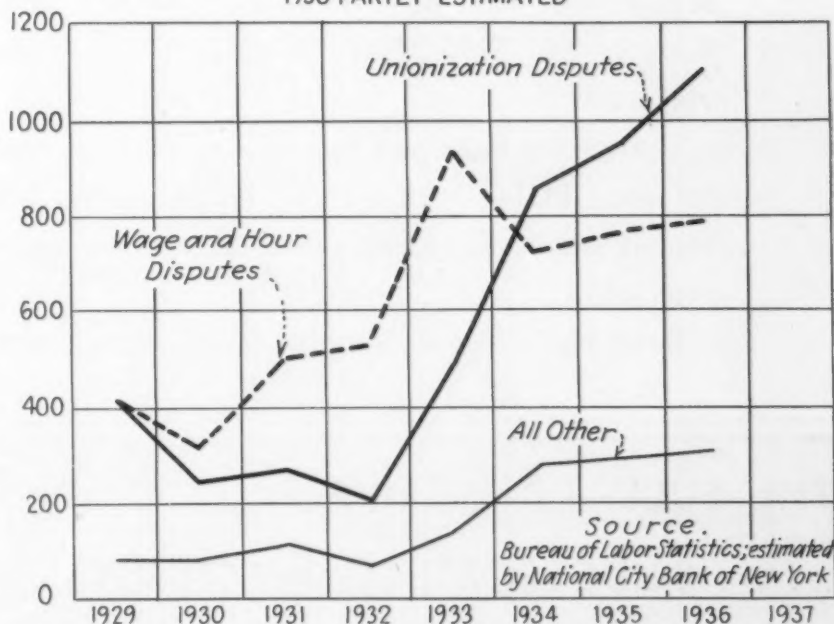
based solely on length of service, abolition of piece work and reinstatement of employees discharged presumably because of union activity. The proposed agreement with the Chevrolet Motor Co., published in last week's issue of the *ASSEMBLY LINE*, is typical of the specific demands that will be made upon the corporation in this direction.

Legality of Sit-Down Strike Still Unsettled

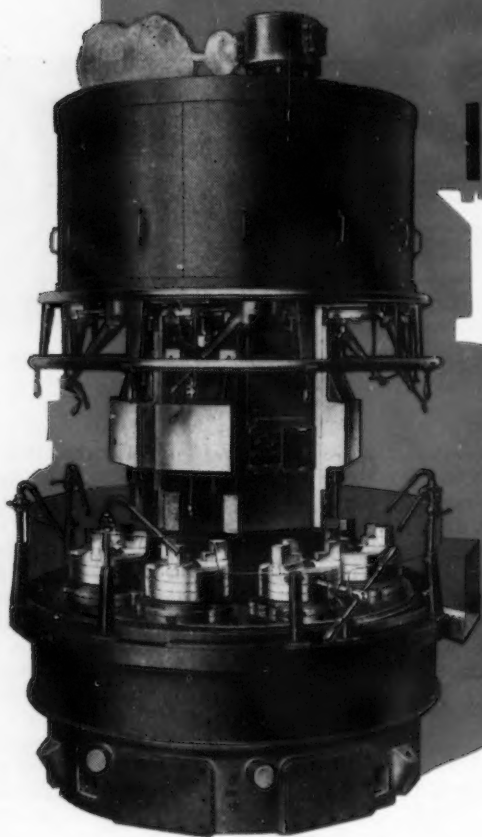
Not settled in the General Motors agreement was the fundamental question of the ethics and legality of the sit-down strike and the endangering of the fundamental guarantees of private property. When all seemed hopelessly dead-

locked, Governor Murphy did a masterful job in bringing both parties together, largely through his untiring efforts and dogged determination to bring matters to a conclusion before he would be put in a position where he would have to do something about the writs served on the Flint sit-downers by Judge Gadola. General Motors has dismissed its demands that the court take action, in an effort to preserve the peace and to minimize the animosities built up during the struggle. Nevertheless, the issue is still there and the record to date shows that the State laws which have been sustained by the courts for a number of decades have been successfully defied. Some definition

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1936 PARTLY ESTIMATED



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There is no hard and fast rule as to what Mult-Au-Matics can do for you. BUT—if others can Profit by this Method—So can you. That is why Bullard Engineers ask for the opportunity to figure on your jobs.

Send blueprints or samples for time and cost estimates.

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BULLARD

of the status of the sit-down strike must be made in the near future, either through an amendment to the Wagner Act, or by Presidential proclamation as to the stand of the Administration. One interpretation at present is that President Roosevelt has permitted this illegal club to be held over General Motors in order to force certain Administration ends such as the reduction of hours.

As things stand now in Detroit, the metal-working industry is decidedly in a state of jitters. The MESA took the cue from the CIO and last week applied sit-down tactics to the Kelvinator plant which went several steps further than the tie-up of General Motors. Under cover in a number of plants in town demands are being made upon management by locals of the UAW and, in the main, these demands are being met and management is negotiating with the union because they realize only too well the effectiveness of the sit-down weapon. Plant managers who thought they had their labor situation well in hand are not so sure now as they realize that without warning an insignificantly small group may tie up the whole works.

General Motors Plants Resume Operations

The main concern of General Motors at the present moment is to get the plants operating again. The day the agreement was signed there were 120,000 persons still on the payroll out of a previous 235,000. In Flint, 3000 started to work Saturday in Fisher Body plants. Approximately 57,000 were called back to work at other divisions beginning Monday, Feb. 15, and more are to follow as rapidly as operations can be resumed. Oldsmobile, Pontiac and Buick have been carrying on manufacture of motors and other components on a reduced basis and now have large banks ahead. The plug that is holding back operations on the assembly line is the Fisher plants, which will take some days to get into operation. Equipment suffered practically no damage during the sit-down strike, although some materials, particularly textiles, were ruined through being used as bedding. One of the key stamping plants is in Cleveland, but a number of duplicate dies have been made for the Grand Rapids stamping plant, which should be one of the first units to reach peak production.

Steel releases went out immediately following the settlement, and there is no question but that all suppliers will bend every effort to see that material shortages do not embarrass General Motors.

Most plants, however, have sizable banks of material on hand and in Flint alone there are 60 carloads of steel on demurrage in freight cars during the past month. There are also sizable quantities of finished steel ready for shipment at the mills, so that there should be ample material for General Motors' requirements. Mr. Knudsen estimated that peak production would be reached during March and that approximately 225,000 units would be assembled in all divisions. The backlog of orders is high and dealers are "rarin' to go."

Strike Did Not Seriously Affect New Car Sales

The end of the strike finds thousands of retail automobile dealers ready to take care of quick distribution of new cars, according to the National Automobile Dealers Association. As it turned out, the strike was really a blessing in disguise, because it gave dealers a chance to sell most of their used cars. Back in December, the only real threat to new car sales was the fact that inventories of used cars frozen over the winter months might back up on new car sales by making it impossible for many dealers to complete a trade on a new car.

The tie-up of General Motors plants did not seriously affect new car sales in January. Retail sales in the United States totaled 92,998 units, compared with 102,034 in January, 1936. December sales were 173,472. On the other hand, sales

to dealers in the United States totaled 70,901 in January, compared with 131,134 in January a year ago. The December figure was 197,065.

January production of the industry, excluding Ford, was 269,839 units, as compared with 276,451 in January, 1936, and with 401,459 in December, 1936. At that, last month's production was 67 per cent above the five-year January average, although 33 per cent under the total for December. At least one General Motors unit, Pontiac, reported January retail sales the largest of any January in its history and almost 65 per cent above the January, 1936, figure. Another company that has reported high January sales is Nash, which shipped more than twice as many automobiles as in January, 1936. Since the announcement in October, sales of Nash models have been double those of the same period a year ago.

Slight Gain In Output

Total output of cars and trucks in the United States and Canada advanced from 72,010 units to 74,145 for the week ended Feb. 13, according to Ward's Automotive Reports. Last year, when bad weather was a hampering factor rather than strikes, the corresponding figure was 79,143. Ford's production remained practically unchanged from the previous week, but Chrysler advanced from 25,350

(CONTINUED ON PAGE 89D)

STUDEBAKER is the only survivor of the horse and buggy days. Last Monday the corporation celebrated its 85th anniversary and announced that it had produced 1,750,000 Studebakers to date. Pictured is one of the buggies produced in the early fifties, together with Paul G. Hoffman, president of Studebaker Corp.



Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

	January, 1937	December, 1936	January, 1936	Year, 1935	Year, 1936
Raw Materials:					
Lake ore consumption (gross tons) ^a		4,551,379	2,951,568	30,857,862	44,639,318
Coke production (net tons) ^b		4,608,655	3,450,342	35,141,261	46,317,087
Pig Iron:					
Pig iron output—monthly (gross tons) ^c	3,211,500	3,115,037	2,025,885	21,007,802	30,618,797
Pig iron output—daily (gross tons) ^c	103,597	100,485	65,351	67,556	83,658
Castings:					
Malleable castings—production (net tons) ^d ...		61,674	48,198	456,395	571,696
Malleable castings—orders (net tons) ^d		67,035	43,852	452,611	576,334
Steel castings—production (net tons) ^d		83,615	44,298	398,988	805,691
Steel castings—orders (net tons) ^d		159,430	59,019	400,157	909,080
Steel Ingots:					
Steel ingot production—monthly (gross tons) ^e ...	4,736,697	4,431,645	3,045,946	33,417,985	46,919,362
Steel ingot production—weekly (gross tons) ^e ...	1,069,232	1,002,535	687,572	640,928	897,463
Steel ingot production—per cent of capacity ^e ...	81.42	77.66	51.40	48.54	68.52
Finished Steel:					
Trackwork shipments (net tons) ^f	7,246	5,579	3,366	42,229	68,813
Steel rail orders (gross tons) ^g	25,700	125,290	208,541	533,120	1,053,230
Sheet steel sales (net tons) ^h		336,758	174,805	2,473,489	2,720,330
Sheet steel production (net tons) ^h		230,581	223,000	2,424,990	2,598,140
Fabricated shape orders (net tons) ^h		166,542	120,354	1,068,603	1,609,016
Fabricated shape shipments (net tons) ^h		121,775	79,995	1,095,216	1,548,205
Fabricated plate orders (net tons) ^d		51,017	38,709	258,315	484,038
Reinforcing bar awards (net tons) ^e	10,220	18,550	62,210	318,340	334,790
U. S. Steel Corp. shipments (tons) ^h	1,149,918	1,057,365	721,414	7,371,299	10,825,132
Ohio River steel shipments (net tons) ⁱ		111,450	65,760	925,174	1,169,321
Fabricated Products:					
Automobile production, U. S. and Canada ^k		519,132	377,306	4,119,811	4,616,857
Construction contracts, 37 Eastern States ^l	\$242,844,000	\$199,695,700	\$214,792,800	\$1,844,544,900	\$2,675,296,000
Steel barrel shipments (number) ^d		895,481	542,597	6,872,452	8,600,493
Steel furniture shipments (dollars) ^d		\$2,112,972	\$1,586,446	\$15,523,679	\$19,245,935
Steel boiler orders (sq. ft.) ^d		1,872,139	623,364	6,245,158	11,511,557
Locomotive orders (number) ^m	46		14	83	
Freight car orders (number) ^m	10,881		1,050	18,599	
Machine tool index ⁿ	200.3	257.7	110.8	†99.9	†201.7
Foundry equipment index ^o			127.0	†119.5	†178.5
Foreign Trade:					
Total iron and steel imports (gross tons) ^p		52,584	50,489	470,015	666,838
Imports of pig iron (gross tons) ^p		10,423	15,036	130,937	165,909
Imports of all rolled steel (gross tons) ^p		19,968	22,958	216,628	270,594
Total iron and steel exports (gross tons) ^p		244,156	241,564	3,063,505	3,162,694
Exports of all rolled steel (gross tons) ^p		126,173	79,100	897,883	1,167,244
Exports of finished steel (gross tons) ^p		117,979	74,254	767,590	1,040,815
Exports of scrap (gross tons) ^p		109,026	153,906	2,103,959	1,941,031
British Production:					
British pig iron production (gross tons) ^r	650,700	671,400	595,500	6,426,400	7,681,600
British steel ingot production (gross tons) ^r	998,900	1,019,200	911,700	9,842,400	11,699,000
Non-Ferrous Metals:					
Lead production (net tons) ^s		47,085	35,296	421,764	463,187
Lead shipments (net tons) ^s		51,646	34,590	433,456	512,975
Zinc production (net tons) ^t	40,025	47,050	41,917	431,499	524,271
Zinc shipments (net tons) ^t	50,638	59,821	46,468	465,746	563,273
Deliveries of tin (gross tons) ^v	7,615	6,930	6,635	59,110	74,005

† Three months' average.

Source of figures: ^a Lake Superior Iron Ore Association; ^b Bureau of Mines; ^c THE IRON AGE; ^d Bureau of the Census; ^e American Iron and Steel Institute; ^f National Association of Flat-Rolled Steel Manufacturers; ^g American Institute of Steel Construction; ^h United States Steel Corp.; ⁱ United States Engineer, Pittsburgh; ^j When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of Census; ^k F. W. Dodge Corp.; ^l Railway Age; ^m National Machine Tool Builders Association; ⁿ Foundry Equipment Manufacturers Association; ^o Department of Commerce; ^p British Iron and Steel Federation; ^q American Bureau of Metal Statistics; ^r American Zinc Institute, Inc.; ^s New York Commodities Exchange.

Per Cent

175

150

125

100

75

50

25

0

CAPITAL GOODS ACTIVITY

Per Cent

175

150

125

100

75

50

25

0

1933

1934

1935

1936

1937

THE IRON AGE Weekly Index Numbers of Capital Goods Activity

(1925-27 Average = 100)

Last week	86.8	Same week 1933	33.3
Preceding week	85.3	Same week 1932	41.3
Same week last month	93.3	Same week 1931	69.3
Same week 1936	73.4	Same week 1930	98.3
Same week 1935	63.2	Same week 1929	121.0
Same week 1934	58.4		

THE index of capital goods activity reversed its downward trend last week, and, after correction for customary seasonal movement, rose to 86.8 per cent of the 1925-27 average against 85.3 per cent for the preceding week, a net gain of 1.5 points. Previous to this the index had been in a steady decline for approximately a month and a half.

Outstanding event of the past week was the settlement of the strike at General Motors' plants. Production showed no improvement from this cause, but other factors influenced a rise in total assemblies to 74,145 units from 72,010 units in the preceding period. Carloadings of forest products rose to 32,526 cars from 30,991 cars. Both these increases were more than seasonal, and the adjusted automobile and lumber indices contributed in part to the rise

in the general activity index.

In the Pittsburgh area there was a substantial industrial upswing, or in excess of the seasonal movement. Heavy construction work showed little or no change after adjustment.

While the continued recession during January in the general activity index looked unfavorable, the average for the month was 91.7 per cent of 1925-27 as against only 78.8 for January, 1936, and 60.8 for January, 1935. During December, however, the average was 97.8.

The weekly index of wholesale commodity prices, prepared by *The Annalist*, rose last week to 140.2 per cent of its 1913 base year average from 138.1 per cent in the week before. This high level was last touched on Jan. 7, 1930.

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from *Engineering News-Record*.

WASHINGTON



By L. W. MOFFETT
Resident Washington Editor,
The Iron Age

... John L. Lewis, emboldened by partial success in General Motors strike, turns attention to coal and steel.

... Labor troubles on many fronts may force the issue upon the White House, particularly if Wagner Act should be declared unconstitutional.

... Coal conference takes place this week and Steel Workers' Organizing Committee plans convention to formulate demands upon steel industry.

WASHINGTON, Feb. 16. — "Labor marches on!"

Yielding to his penchant for the dramatic, John L. Lewis uttered these words from a sickbed in Detroit upon the announcement of the General Motors strike settlement agreement. And a nervous country, fearful that the march will lead to a quagmire of industrial paralysis and widespread unemployment, saw the march quickened as moves were made under the direction of Lewis in the steel and coal industries, with other industries facing like threats.

That Lewis is preparing to move on steel was announced by him in Detroit Saturday. Declaring that the General Motors strike settlement broke "the united front of capital and labor," Lewis predicted success for the CIO when it submits demands on the steel industry. In his own smug way, he expressed the hope that the steel industry "will approach the problem rationally," and added that he didn't anticipate a strike. Nevertheless, Lewis referred to the steel unionization drive as "the crouching lion of the labor movement."

For, whether justified or not, the General Motors agreement further emboldened Lewis in his determination to dictate the labor policy of industry. It was followed by increased activity of the Steel

Workers Organization Committee, affiliate of Lewis's Committee for Industrial Organization, looking to unionization of the steel industry, and by increasingly insistent demands by Lewis's United Mine Workers' Union for a 30-hr. week in the coal industry without a decrease in wages.

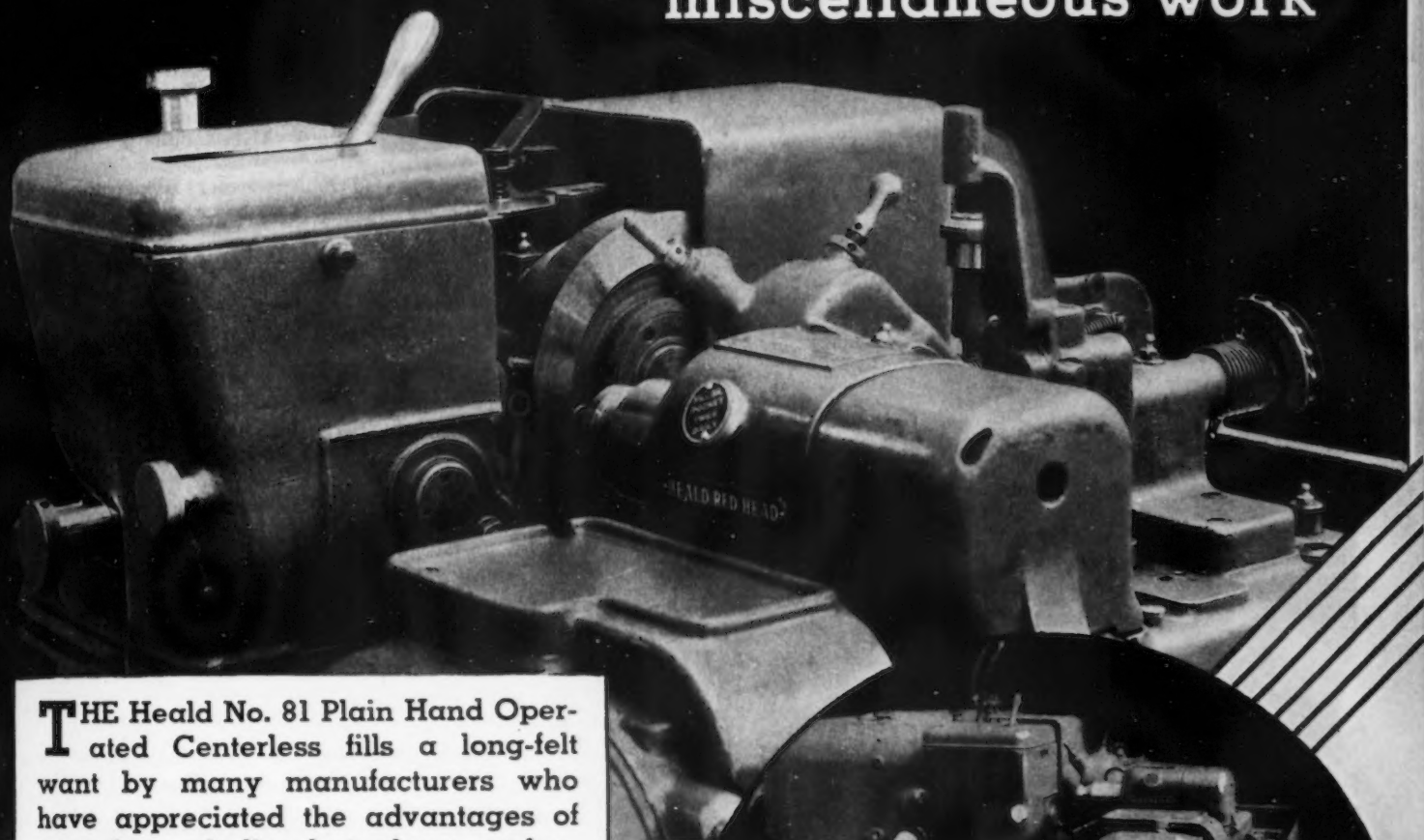
The SWOC, affecting to see a big victory for the United Automobile Workers' Union, also a CIO affiliate, in the General Motors agreement, is reported to have arranged for a national convention in Pittsburgh next month to press demands upon the steel industry. Claiming to have a membership of 128,000 in the industry at present, SWOC leaders, under the guidance of Lewis, have further stimulated their unionization drive in the hope that they may put up a strong front to enforce recognition. As outlined by Lewis, demands are for recognition of the SWOC as the exclusive collective bargaining agency, a 30-hr. week and a minimum wage of \$2,500 a year. They are demands which Lewis, of course, does not expect to see realized. No more so than were his demands upon General Motors realized.

Coal Conference This Week

In the field of coal, the international policy committee of the UMW went into conference in

Washington last Friday to frame demands to be presented to coal operators in New York at a meeting which begins tomorrow to negotiate a new wage agreement, effective April 1. Coal operators are not only strongly resisting the UMW demands, but are insisting that the present 35-hr. week be increased to 40 hr. with no increase in wages. There is a feeling that, despite his threats to call a coal strike if UMW demands are not met, Lewis will accept renewal of the present agreement and that, in the face of their insistence on a longer work week, coal operators will do likewise. Nevertheless, there also prevails a view that both sides may take such a determined attitude as to threaten labor trouble. Coal operators insist that already the 35-hr. week has so increased costs that their competitive position with oil and gas has deprived them of markets and that it is necessary to have a 40-hr. week in order to be put on a parity with competing fuels. On the other hand, concern is felt that Lewis as a matter of strategy in connection with the CIO steel unionization drive will make use of the coal negotiations to get a firmer hold of steel-owned captive coal mines and thereby strike at the steel industry. It is reported that Lewis not only hopes to organize these captive mines much further than at present, but

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Internal Centerless
*for long small holes—
miscellaneous work*



THE Heald No. 81 Plain Hand Operated Centerless fills a long-felt want by many manufacturers who have appreciated the advantages of centerless grinding but whose production, being limited and of miscellaneous nature, does not warrant the purchase of a fully automatic centerless.

This machine differs from the automatic centerless in that the work, instead of being automatically loaded and ejected, is loaded and removed by hand. This is accomplished by means of a hand lever which raises the pressure roll.

The No. 81 Hand Operated Centerless is especially desirable on extra long holes such as in Diesel fuel pump barrels, for the work can be easily and quickly reversed in the rolls for grinding from each end. For those very fussy jobs the work can be removed from the rolls for checking at any time without disturbing the concentricity of the bore with the outside diameter.



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will seek to break down resistance to his effort to apply the existing check-off to an additional assessment of union workers, increasing the per capita monthly dues from \$1 to \$2. The purpose clearly is to build up a war chest for use in the steel and other unionization campaigns.

Further labor difficulties growing out of the Walsh Healey Government Contracts Act are becoming more acute, so much so that President Roosevelt himself has taken a

hand in the situation as it relates to the inability of the Navy Department to get urgent steel requirements. The Navy Department is seeking exemption for the steel industry from a hard and fast 40-hr. week requirement, the chief obstacle to the submission of bids for Navy steel. The Department of Labor, under the direction of Secretary Frances Perkins, has shared with organized labor, both the CIO and the American Federation of Labor opposition to any relaxation

of regulations governing the act. The Navy Department, anxious to push its building program, is also said to be hampered by hour limitations in private yards.

What the White House will do about the batch of labor troubles, present and threatened, is a source of apprehensive interest. For, it is the belief that either directly or indirectly the President will have to take a hand in their settlement. Certainly there is adequate precedent on which to base the belief. For, while the President was represented as being in the "background" in connection with the General Motors-UAW negotiations, actually he became the chief moving spirit in them. Acting through Governor Frank M. Murphy of Michigan, the President virtually commanded General Motors officials to negotiate with Lewis and other union officials as sit-down strikers defied a court injunction order and remained in defiance of it until the agreement was reached and the G-M plants were voluntarily evacuated. Clearly this was a partial victory for Lewis and the UAW, unenviable victory though it was.

As to the agreement itself — made by both sides with Governor Murphy and not directly between the disputants—it is believed that White House pressure for an early settlement had at least a great deal to do with its terms. And, though it has been belittled in some quarters, it is likewise the view that public opinion was a stronger force than has been commonly recognized in bringing the strike to an end. It was clear that there was a growing public hostility toward condonation by constituted authorities and union officials of the sit-down strike and defiance of the court. Lewis is said to have sensed this rising opposition to him and his CIO and its significance as it affected his ambitions to be the labor dictator of the country. It is suspected that Federal and State officials also were aware of this growing public indignation, and that it stimulated their moves to bring the strike to as early an end as possible.

Who Won the G-M Strike?

In Washington there is a conflict of views as to "who won" under the terms of the agreement. Though officials gingerly evade the subject of who won, it is naturally widely discussed. Perhaps the prevailing opinion is that Lewis succeeded in getting his foot in the door, but no further for the present. At that he assuredly lost his big point, recognition of the UAW as the sole agency for collective bargaining. Recognition of the UAW as representative of G-M em-



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ployees who are members of that organization was granted, but G-M offered to do that even before the negotiations began. It does, however, give the union a standing it had not had previously. The agreement of G-M to deal with the UAW exclusively for six months as to 20 "struck" plants on "matters of general corporate policy," except with Governor Murphy's sanction to negotiate with other unions, undoubtedly was a gain for the UAW, but its extent depends on the character and outcome of the negotiations, which began today. The provision probably will prove embarrassing to Governor Murphy in view of the prospect that President Green of the American Federation of Labor may be expected to insist that federation unions be permitted to participate in the negotiations or other strong labor forces might rise to make a like demand of the Michigan Governor.

It is definite that the UAW made important concessions. It agreed to refrain from coercing employees to join to the union, to refrain from membership recruiting on company premises and to refrain from calling strikes or interfering

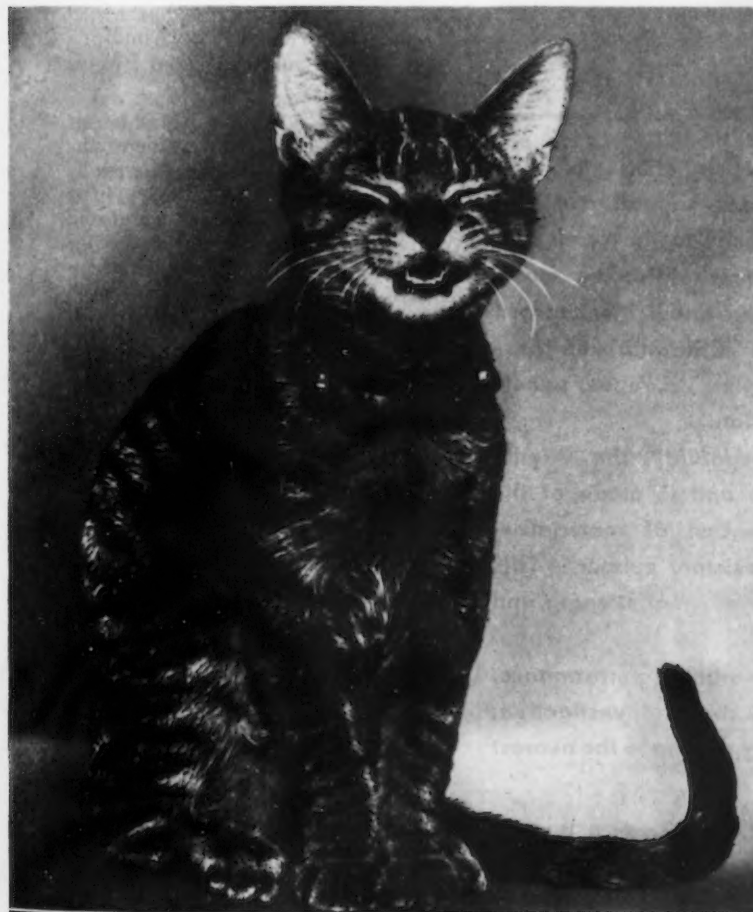
with production pending negotiations. The hope in Administration circles is strong that there will be no development to cause a renewal of the strike. The riot started by union groups at the plant of the Guide Lamp Co., G-M subsidiary in Anderson, Ind., caused concern, even if UAW officials disclaimed responsibility.

Proportional Representation Accepted

Comment has been made that though there are conflicting doubts as to which, if either side, won, there is no doubt that organized society lost. Not merely in dollars and cents, wages, destroyed property, etc., but in the blow to established law, which, since the court's injunction order was scorned, was disregarded not only by organized labor officials but also by high public officials. Simply to contemplate what enforcement might have meant, whether with good reason or not, is hardly the answer. The brand of sanction on the sit-down strike was implied or directly given, and with it negligence of official duty. Hence, what is to prevent further sit-down strikes, unless it is that union organization

forego the practice further, fearing the wrath of public opinion?

A feature of the G-M-UAW agreement that is interesting is the acceptance by Lewis of the principle of proportional representation. Organized labor, with Lewis one of its chief spokesmen, raged against the National Automobile Labor Board set up under the NRA because of its principle of proportional representation, a principle which at the time was lauded by President Roosevelt. So strong was organized labor opposition that the Automobile Board, then ably headed by Dr. Leo Wolman, was abolished and the principle of exclusive representation by the majority was set forth in the Wagner Act at the demand of the American Federation of Labor. Hence the G-M-UAW agreement principle of proportional representation is in direct conflict with the law — the Wagner Act, administered by the National Labor Relations Board. It was because Lewis had to surrender the demand that the UAW be the sole bargaining agency that President Green of the A. F. of L. said the agreement "represents a surrender in a very large way to the demands of General Motors



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management." Yet, curiously enough, Mr. Green is insisting that, whether they are in the majority or minority, the rights of his craft unions in the automotive industry be recognized. Donald Richberg, former NRA administrator, and at present a close adviser to the White House, is strongly on record in favor of minority representation in collective bargaining.

Wagner Act Before Supreme Court

This principle of proportional representation included in the

G-M-UAW agreement developed more speculation than possibly it would have otherwise because by coincidence it was brought forth while the Wagner Act was being hotly argued before the Supreme Court. In all, five cases attacking the constitutionality of the act were argued before the court last week and consideration of the argument now is under way. When decision on this vital issue may be forthcoming can only be a guess. Hope is expressed, however, that it may be handed down within a

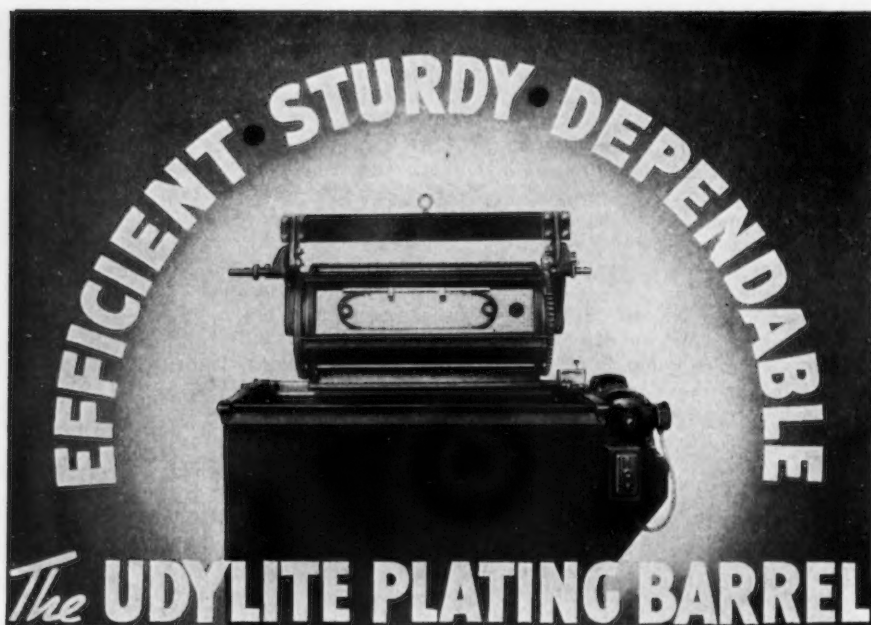
month or six weeks. It is reported that it is because of fear that the act will be invalidated that the President is seeking, despite widespread opposition, to force through his demand for reorganization of the Supreme Court as a prelude to jamming wage, hour and collective bargaining legislation through Congress, fortified by a sympathetic Supreme Court.

Chief among the Wagner Act cases was that of the Jones & Laughlin Steel Corp., represented by Attorney Earl Reed, who insisted that the Wagner Act is part of a plan of Congress to regulate labor conditions and industrial matters, matters that are reserved to State control. He contended that it violated the commerce clause of the Constitution and the provision guaranteeing freedom of contract. His argument that manufacturing is intrastate commerce and therefore not subject to Federal jurisdiction reflected the point made by the Eighth Federal Circuit Court of Appeal in New Orleans. Asked by the National Labor Relations Board to enforce a board cease and desist order against Jones & Laughlin, the court held that the law was unconstitutional. The board had charged discrimination by Jones & Laughlin against 10 members of the Amalgamated Association of Iron, Steel and Tin Workers who were discharged from the company's Aliquippa plant. They were officers of Beaver Valley Lodge.

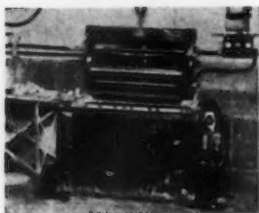
Chairman J. Warren Madden of the NLRB, ardent supporter of the act administered by the board he heads, jumped into the fray for the Department of Justice, and told the court that workers were intimidated by the company and insisted that the Wagner Act is valid because the J. & L. plant at Aliquippa, Pa., is situated in the stream of commerce, drawing its raw materials from other states and shipping its finished materials to still other states. The Wagner Act, Madden contended, has force where the NRA and the Guffey coal acts fell. In the NRA (Schechter) case, he said, the flow of goods had come to rest, while in the Guffey Act (Carter Coal) case, the flow had not yet begun.

Searching questions were directed to Government counsel by Justices of the court as they argued the Jones & Laughlin case. Mr. Justice Sutherland significantly asked Mr. Madden whether the 10 discharged employees were engaged in the manufacturing or transportation branches of the J. & L. operations.

Solicitor General Stanley Reed argued, as did Mr. Madden, that

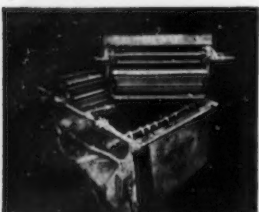


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Congress has the power to regulate conditions causing strikes in the steel industry. Attorney Reed for J. & L. maintained that the Government in effect was asking the Supreme Court to change a century-old interpretation of the Constitution to give Congress authority over matters "repeatedly declared beyond its jurisdiction."

The point made by the solicitor general that labor disputes lead to strikes, which in turn affect commerce, was met with direct reply by the J. & L. attorney. He said that if the Government's theory that the discharging of 10 of the company's 22,000 employees might create dissatisfaction which might lead to a strike in which the workers might have the intent to obstruct commerce is sustained, Congress can then regulate any employer-employee relationship in virtually any industry. "We deny that Congress has this right," said counsel for J. & L.

Declares Steel Production Is Not Interstate Commerce

Attorney Reed also challenged the Government argument that operations of a steel mill are an integral part of the flow of interstate commerce. He made this argument in replying to the solicitor general's contention that Congress had authority under the interstate commerce clause to regulate conditions causing labor disturbances when such conditions have a direct effect upon the flow of commerce among the states. The solicitor general sought to draw an important distinction between the regulation of the causes of labor disturbances and the actual regulation of labor conditions such as wages and hours, which the Supreme Court has held to be beyond the power of Congress.

"But," Mr. Justice Sutherland inquired, "what is the primary effect of a strike in a steel mill? Is it not to curtail production?"

Agreeing that this is at least one result, the solicitor general was asked by the justice if after curtailing production, a strike in turn did not affect commerce.

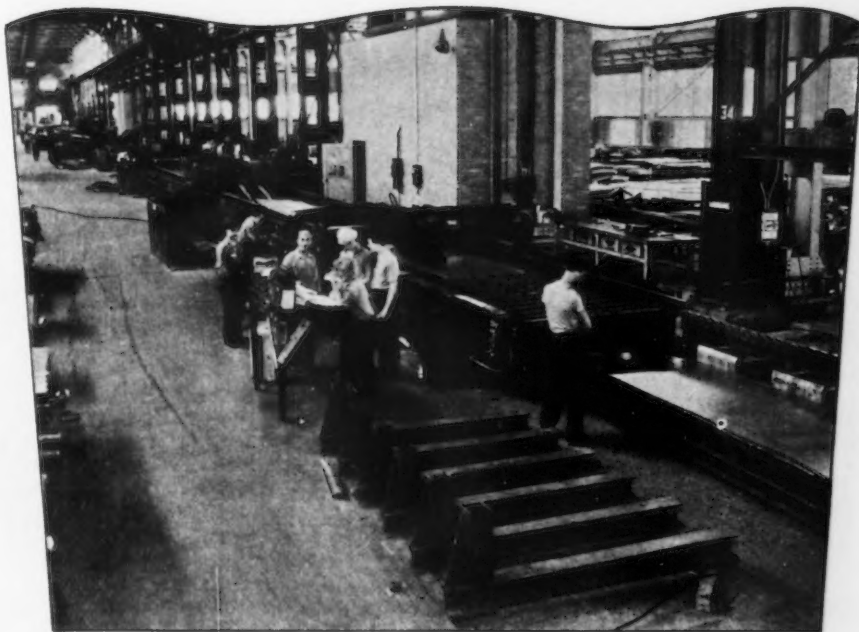
"The effect on commerce is secondary, is it not?" Mr. Justice Sutherland further asked.

The solicitor general disagreed, saying he regarded the effect on commerce as "instantaneous" with the curtailment of production.

When Mr. Madden cited the flow of materials into and out of the Aliquippa plant to show that interstate commerce was involved, Mr. Justice Sutherland asked:

"But the men involved in this case were not engaged in transportation, were they?"

"No," replied Mr. Madden, "but



EFFICIENCY IN STEEL PRODUCTION DEPENDS UPON CONVEYERS

IN 1910 the Steel Industry produced 30 tons a year for each worker employed—in 1930 it produced 42 tons. But in addition to this tonnage increase per worker, the production of 1930 was largely composed of much more highly processed and finished materials.

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they were engaged in a business in which there was a constant flow of the products of the mill."

Mr. Justice McReynolds asked the solicitor general about the effect of the Labor Board's order and was told that it was to restore the employees to their original positions.

"Restored at will," Chief Justice Hughes interposed. "They couldn't be dismissed the next day, could they?"

Attorney Reed for J. & L. said that the company's ore, limestone and coal are stored at the plant, thus bringing the interstate commerce movement to a full stop. The Wagner Act, he said, is wholly an attempt by Congress to intrude

into industrial relations that are a state matter.

Mr. Reed said that the Government's argument is economic, that it might be a good thing as Dr. Madden said, if the Government could control labor relations. Dr. Madden, he declared, may think the states are handling the situation stupidly, but that is not the law.

"For a century this court has held to the simple literal meaning that the great Marshall found in the commerce clause, that Congress has the power—in the words of the Constitution—to regulate commerce among the several states—but the local activities, such as mining and industry, are within their exclusive jurisdiction," said Mr. Reed.

Wage Differentials Ignored in Ruling

WASHINGTON, Feb. 16.—It may or may not be a precedent, but concern prevails nevertheless over a recent ruling of the Department of Labor prescribing a national and uniform minimum wage for plants making men's garments for the Government under the terms of the Walsh-Healey Act. The minimum itself, only \$15 a week, is not the point at issue. The question is whether the ruling establishes the principle of not recognizing wage differentials in any given industry, regardless of the section of the country and economic factors, such as the cost of production and the cost of living.

The department in declining to fix wage differentials in the men's garment industry held that all areas were competitive and took no cognizance of varying economic factors. In steel and other indus-

tries wage differentials are traditional and are based on such factors. They were definitely recognized by the National Recovery Administration in codes. It is clear that if attempt were made to wipe out wage differentials, the resistance to the Walsh-Healey Act that has developed would be intensified with the result that the Government would find it increasingly difficult to obtain supplies through even greater refusal than now exists to submit bids on Government contracts.

NOTICE

OWING to the fact that our printing department will be closed Washington's Birthday, Feb. 22, next week's issue, Feb. 25, will be delivered a day later than usual.

Michigan Bridges Near Action

THE proposed bridge connecting Port Huron, Mich., with Sarnia, Ont., over the St. Clair River is nearing a point where bids for construction will soon be asked by the State Highway Commissioner, Murray D. Van Waggoner. Options on property for the approaches have been obtained and as a preliminary step the Port Huron-Sarnia Ferry Co. has been taken over by the State at a purchase price of \$500,000. The State Highway Commission has also signed \$1,900,000 worth of revenue bonds to finance bridge construction. The Ontario Highway Commission has advanced the Michigan commission \$650,000 for building approaches on the Canadian side of the river. Two years will be required to complete the span. About 8850 tons of steel will be required.

The proposed bridge across the St. Clair River will be a steel cantilever type with a single span 850 ft. long. Over-all length including approaches will be 6392 ft. The center of the span will clear the water by 152 ft. and the roadway will be 32 ft. between curbs, with a 5-ft. walk on one side. The Michigan Bridge Commission will operate the bridge until the \$1,900,000 bonded debt is amortized.

Another Michigan bridge that is yet merely in legislative form is the proposed structure across the Straits of Mackinac, to cost \$32,000,000. Bills are now before both houses of Congress in Washington calling for funds for the preliminary surveys on this project. Ferry service across the Straits in 1936 carried 200,000 motor cars. The bridge would be seven miles in length and would be a Federal-State project.



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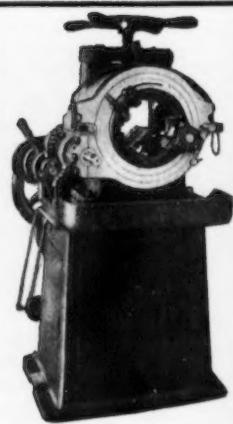
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Silicosis Conference Recommends Preventive Methods to Employers

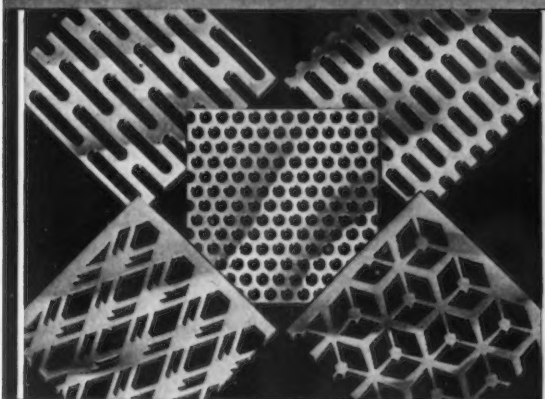
THE National Silicosis Conference, which was first called together by Secretary of Labor Frances Perkins on April 14, 1936, held another meeting here on Wednesday, Feb. 3, at the invitation of the Secretary, and the day was devoted to the presentation of reports covering medical, economic, engineering, legal and insurance phases of the problem. The meeting was conducted by Verne A. Zimmer, director of the Division of Labor Standards, Department of Labor.

The purpose of this and subsequent conferences that may be held was summarized by the Department of Labor as follows:

"During the past few years so many conflicting statements have been made about the subject of silicosis that many persons have become confused. They do not know what to believe or what to do. Alarmed workers have filed claims against their employers, sometimes unjustly. Apprehensive employers in some cases have adopted employment policies that have reacted unfavorably both against themselves and the workers. A few incompetent attorneys and physicians, particularly in court cases, have further complicated the situation, so that today a condition exists that fully deserves thoughtful consideration and some definite declarations by those who are competent to speak."

The conference was well attended by public health officials and representatives of industrial and labor groups. Among those who presented reports on various phases of the problem are Surgeon R. R. Sayers of the United States Public Health Service, chairman of the committee on prevention of silicosis through medical control; Warren A. Cook, State Department of Health of Connecticut, chairman of the committee on the prevention of silicosis through engineering control; V. P. Ahearn of the National Sand and Gravel Association, Washington, chairman of the committee on eco-

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nomie, legal and insurance phases of the problem, and L. Metcalfe Walling, Labor Commissioner, Providence, R. I., chairman of the committee on regulatory and administrative phases of the problem.

There being no known cure for silicosis, the efforts of the conference are being directed toward sci-

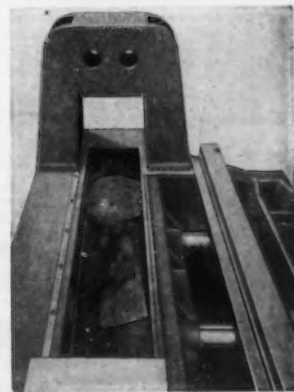
entific methods of prevention. It was stated that in general there are three ways to prevent silicosis: first, by preventing the creation of silica dust; second, by preventing the dispersion of dust into the atmosphere of a working area; and third, if it is impossible to apply the first two methods, by the use of

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personal protective equipment such as respirators to prevent the inhalation of dust.

It was stated that the adoption of preventive methods devolves largely upon the employer, who must do most of the work and spend most of the money, but it was pointed out that his work and his money will never accomplish maximum results unless the worker is willing to cooperate and carry his share of the responsibility for helping to control dust and for using the personal protective equipment.

Among the things that the employer should do in formulating a silicosis-prevention plan, the following were listed:

Survey the working conditions.—Any employer who has reason to believe that his workers are exposed to the hazard of breathing silica dust should make a survey of the working conditions. This will enable him to determine the severity of the hazard and will probably indicate what, if anything, needs to be done to decrease the hazard.

Secure information on best procedure.—Before formulating a program for decreasing the silicosis

hazard, the employer should secure the best information obtainable. Usually he can secure valuable data from the leaders in his industry, perhaps from the codes prepared by certain industries, from his State bureau of industrial hygiene, and from other sources.

Comply with laws, rules and regulations.—It, of course, should be borne in mind that the employer must comply with the laws, rules and regulations that apply to his operations.

Design plant for dust control.—Much can be accomplished through design when new buildings are contemplated or when old buildings are to be remodeled. For instance, structural projections and ledges may be minimized to prevent the accumulation of dust that might later be released into the atmosphere by air currents or by building vibration. Building interiors should be so constructed that they may be easily cleaned by washing, hosing, vacuum cleaning or brushing.

Provide building ventilation.—Special facilities for natural or mechanical ventilation are frequently provided and sometimes serve their purpose in helping to

eliminate dust. Usually, however, such methods cannot be relied upon to provide complete protection in dusty operations.

Store dusty materials in dust-tight bins.—Dusty materials should be stored in dust-tight bins, tanks, or enclosures, but each structure of this type should be provided with a breather or vent stack—perhaps with an exhaust fan in the stack—to permit the air displaced during loading to be carried outside the building.

Enclose material handling equipment.—Excessive dust created by material-handling equipment can usually be confined by housing, and removed by an exhaust system. Some materials can be kept in a moist condition while being handled, but when this is done, the material may dry out and be dispersed into the atmosphere as dust.

Isolate dusty processes.—Where possible, several or all dusty processes may be isolated from the rest of the plant. This sometimes permits the installation of a more compact exhaust system resulting in more efficient operation and lower maintenance cost.

Provide wet methods of operation.—Water, oil, and other liquids may be used effectively:

1. To suppress dust at the point of origin in such operations as rock-drilling; handling, pulverizing, and milling rock and ore; grinding metal on grind-stones; abrasive-wheel cutting of granite and sandstone.

2. To prevent the re-dispersion of dust that has settled on the floors, walls, and other surfaces such as in the granite industry and in foundries.

Design equipment to control dust.—When new machinery or other equipment is contemplated, the manufacturer can frequently be encouraged to include dust control features such as exhaust hoods as an integral part of the design and construction.

Provide exhaust systems.—In some operations, exhaust systems may be installed to remove dust at its point of origin. The technicalities of this subject are discussed in the conference committee reports which should be referred to for detailed data.

Establish maintenance and good housekeeping procedure.—Good housekeeping is unquestionably the cheapest single method of controlling dust. Maintenance goes with it hand in hand. The best equipment in the world will not control dust if superintendents, foremen, and workers are careless and dis-

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orderly in their work. Eight suggestions are advanced by the conference committees:

1. If dust-tight equipment is installed, it should be inspected at regular and frequent intervals and all defects should be corrected as soon as they are detected.

2. Operations should be performed in a manner that will create the minimum amount of dust.

3. Use water under pressure where possible to clean building interiors.

4. If practicable, combine water with air for cleaning purposes.

5. Vacuum cleaning removes dust without dispersing it elsewhere.

6. Brushing is particularly adaptable for cleaning buildings of the older type of construction.

7. Low-pressure steam can sometimes be used to advantage.

8. A responsible person should be assigned the task of supervising maintenance and housekeeping activities. Among other things he should make tests from time to time to make sure that the program of dust control is achieving the desired results.

Provide respirators.—The conference committees agree unqualifiedly that dust elimination must be given primary consideration in solving the silicosis problem. Nevertheless, when known methods of elimination are not applicable or are ineffective, there is still one more thing that can be done; that is, to provide respirators so the workers will not breathe dust into their lungs.

Most respirator manufacturers have submitted their devices for testing and approval by the United States Bureau of Mines. Lists of such devices can be secured by writing to the bureau at Washington.

Instruct the workers.—Giving the workers proper instructions is another thing the employer should do to prevent silicosis. The educational methods used in accident prevention work may be followed to advantage in silicosis prevention. As in accident prevention, the foreman is a key man—his full cooperation is essential.

The conference recommended compulsory coverage for silicosis in the compensation acts of all States, and, because of the competition between the same or similar industries in various States,

it was urged that such laws be as nearly uniform as possible. It further recommended that workers having active pulmonary tuberculosis and silicosis should be removed from employment and should be granted suitable compensation payments and medical care and that workers disabled from silicosis, but having no tuberculosis, should ultimately be granted the same amount of compensation as those disabled by accidental injury. Because of the question of accrued liability raised

by this recommendation, the conference committees were not unanimous in recommending a solution. Some have suggested that an immediate cash benefit of 50 per cent of the statutory benefit should be payable at the time the act takes effect, with a monthly percentage increasing, reaching 100 per cent within five to seven years after the date of enactment, but others suggested special State funds or special Federal grants from which the amounts otherwise denied workers would be paid to them.



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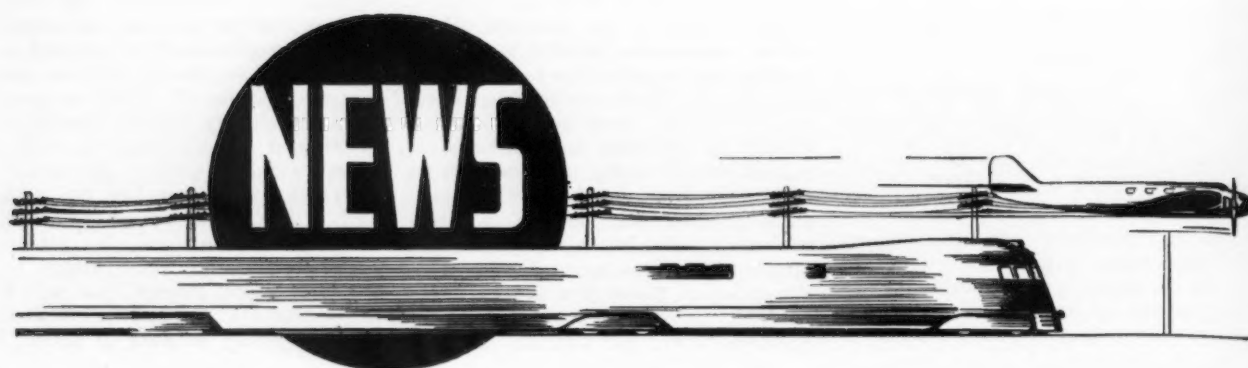
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Carnegie-Illinois and J & L Workers Make New Wage Demands

PITTSBURGH, Feb. 16.—Bringing to the forefront the question of higher wages, less than four months after the granting of a 10 per cent increase, the Pittsburgh district council, composed of employee representatives from 18 Carnegie-Illinois Steel Corp. plants in the Pittsburgh-Youngstown district, last week recommended a \$5-a-day minimum wage and an 80c.-a-day raise for all other workers.

The recommendation was approved unanimously by the council and will now go back to the individual plants, where it will be approved or disapproved by the employee representatives. If approved, the negotiations will then take place between the plant manager and the employee representatives in each plant. The final question will probably eventually be decided by Carnegie-Illinois

management, which has indicated that no increase in wages has been considered.

Coincident with this demand on the part of Carnegie-Illinois employees was the action this week of 36 employee representatives, comprising the general committee at Jones & Laughlin's Aliquippa plant, in asking for a flat \$1-a-day increase for their 12,000 constituents.

Meanwhile, SWOC officials are claiming that the recent automobile settlement was a "victory" for John L. Lewis' Committee on Industrial Organization, and in various speeches throughout this territory over the week-end have indicated that the drive on the steel industry will take place much sooner than was expected some weeks ago. While it had been previously thought that an SWOC

convention would be held in Pittsburgh April 1, it is now the opinion of most observers that this formality will take place early in March. It is expected that demands will be drawn up at that time and presented to the steel industry somewhat in the same manner as those presented to General Motors.

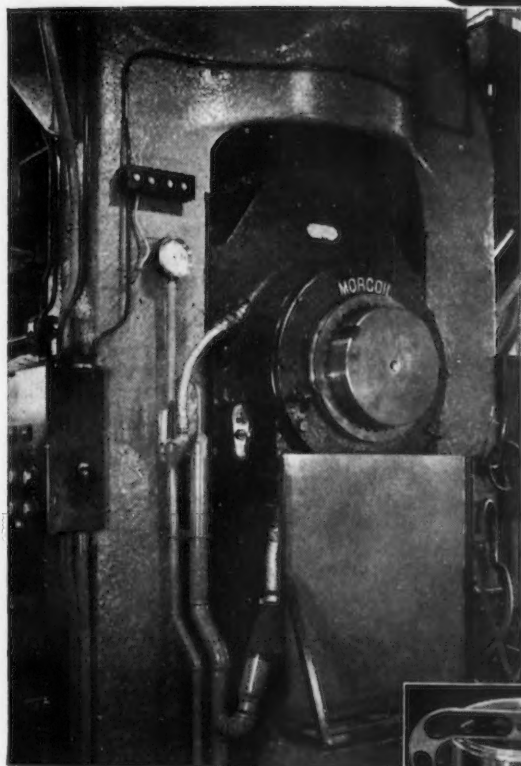
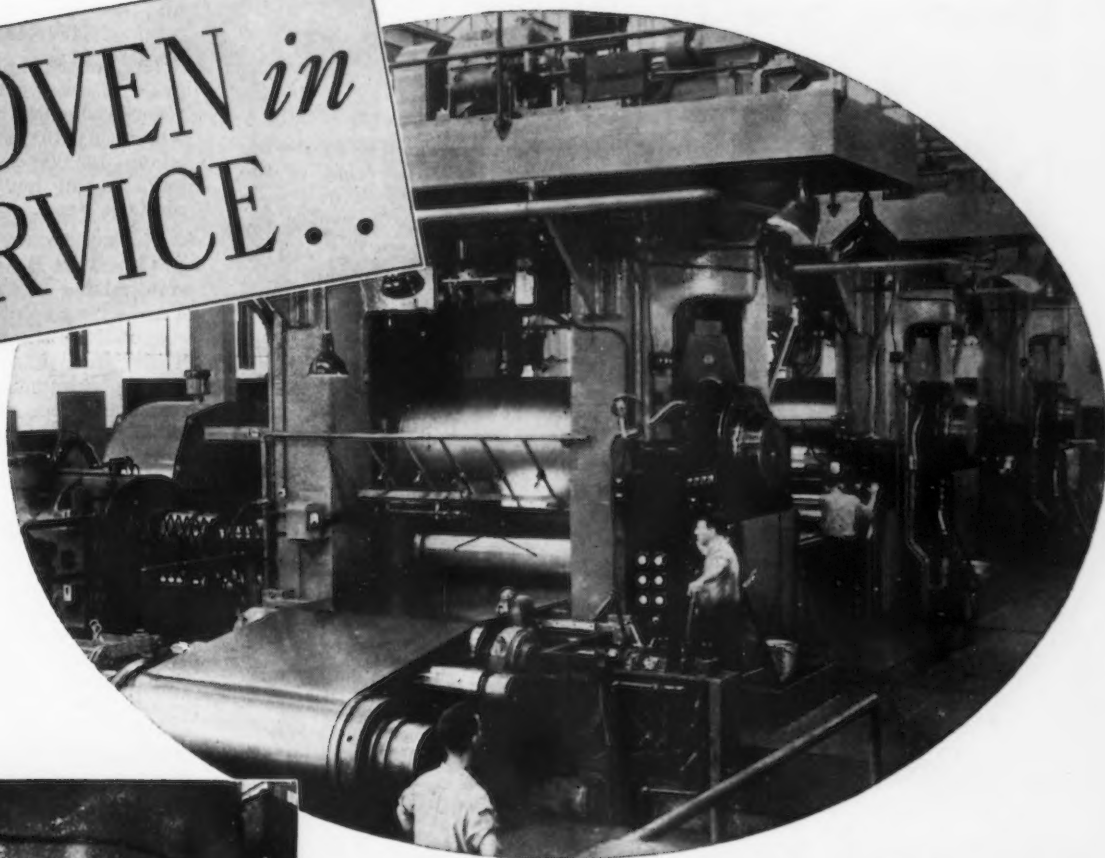
One high SWOC official is credited with saying that a sit-down strike would not be successful in the steel industry "because of the different psychology of steel workers and the physical differences in the plants."

Enough strategy of the SWOC drive has been disclosed to indicate that the help of union miners working at "captive" mines, which are owned by steel companies, might be asked for when the march to call a showdown in the steel industry begins. At the present time the SWOC is claiming a membership of 150,000 steel workers, although it has been admitted that in most of these cases the paying of dues has been waived.

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December Steel Employment 66,000 Above 1929 Level

NEARLY 66,000 more men were employed in the steel industry at the close of 1936 than were at work during 1929, according to estimates made by the American Iron and Steel Institute based on

reports from companies employing approximately 95 per cent of the industry's workers.

Total payrolls of the industry amounted to \$758,060,000 during the year, 36 per cent higher than

the total of \$557,794,000 in 1935, and 66 per cent above the 1934 total of \$457,843,000.

December marked the year's peak in steel employment, payroll records showing that 537,000 were employed during the month, of whom 485,000 were wage earners paid on an hourly, piecework or tonnage basis.

The number of wage earners employed in December was 16 per cent above the total of 419,534 wage earners reported by the Census of Manufactures as employed in the steel industry in 1929. The average number of wage earners employed over the full year was 452,000, or eight per cent above the 1929 average.

Average hourly earnings of wage employees increased during the year to the highest level on record. At the beginning of the year wage earners were earning an average of 65c. per hr., while in December they earned an average of 72.8c. per hr., a figure 11 per cent above their 1929 average hourly earnings of 65.4c. The industry-wide wage increase in November, which averaged 10 per cent, was the fourth general increase in wages since August, 1933.

Although in 1936 both employment and average hourly earnings in the steel industry established new high records, output of the industry was about 14 per cent below the 1929 peak. This was reflected in the total payrolls of the industry for the year, which were also 14 per cent below 1929. Wage earning employees received a total of \$628,900,000 in wages during 1936, compared with the total \$731,000,000 in wages reported for 1929 by the Census of Manufactures.

Total steel payrolls in December were nearly \$76,900,000, of which more than \$64,400,000 were payments to wage earners. Wages in December were at an annual rate of \$773,000,000 per year, \$42,000,000 more than 1929 wages.

The number of hours worked per week by wage earning employees averaged 39.8 for the year, which compares with the 1929 average of 55 hr. per week.

The aggregate value of refrigerating and ice-making apparatus made in 1935 was \$222,389,463, f.o.b. factory prices, an increase of 63.4 per cent over the 1933 total of \$136,123,583, according to the Bureau of the Census. Of the 1935 value, \$118,430,313 was contributed by household electric refrigerators, numbering 1,422,484, an increase of 56.9 in value and of 48.7 per cent in number over 1933.

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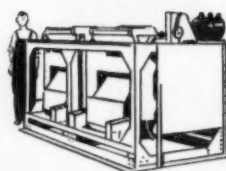
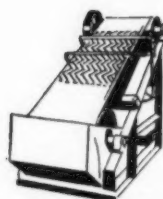
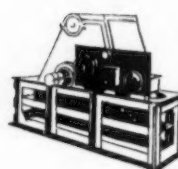
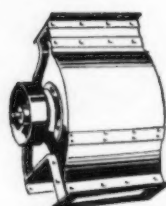
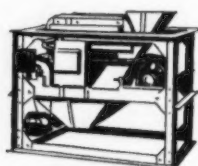
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Pacific Coast Steel Trade Holds Annual Conference at Del Monte

DEL MONTE, Cal., Feb. 15.—Optimism was unmistakable at the thirteenth annual conference of the Iron, Steel and Allied Industries of California held at the Hotel Del Monte, Del Monte, Cal., Feb. 11, 12, and 13. More than 250 attended from all over the Pacific Coast.

Opening the program Thursday morning, W. W. Glosser, conference chairman, stressed the importance of problems to be discussed and urged serious thought on the part of all in attendance. The annual conference was organized, he said, in order to bring about a "better understanding of our common problems" so that the industry would work as a whole rather than in separate units, each looking out only for himself.

National manufacturers are rapidly expanding to the Pacific Coast to meet the ever-increasing demand which is arising from the increased population and business, according to E. O. Shreve, vice-president of the General Electric Co., Schenectady, N. Y. Natural advantages of Pacific Coast conditions with ample water power and raw materials have led many manufacturers to establish branch factories here.

Forecasting tremendous growth in industrial activity on the Pacific Coast in the near future, Mr. Shreve said: "It is my firm belief that some day, not so far in the future, the difficulties of the Far East will largely disappear and, when they do, we shall see a tremendous program built up in the Orient principally because of the vast background of natural resources. Such activity should accelerate business in all countries bordering on the Pacific. This changing picture, it seems to me, is bound to reflect very heavily to the benefit of our Pacific Coast and as a result we should see a great acceleration in the establishment of new enterprises and the further building of branch manufacturing plants and the enlargement of present facilities of national manufacturers."

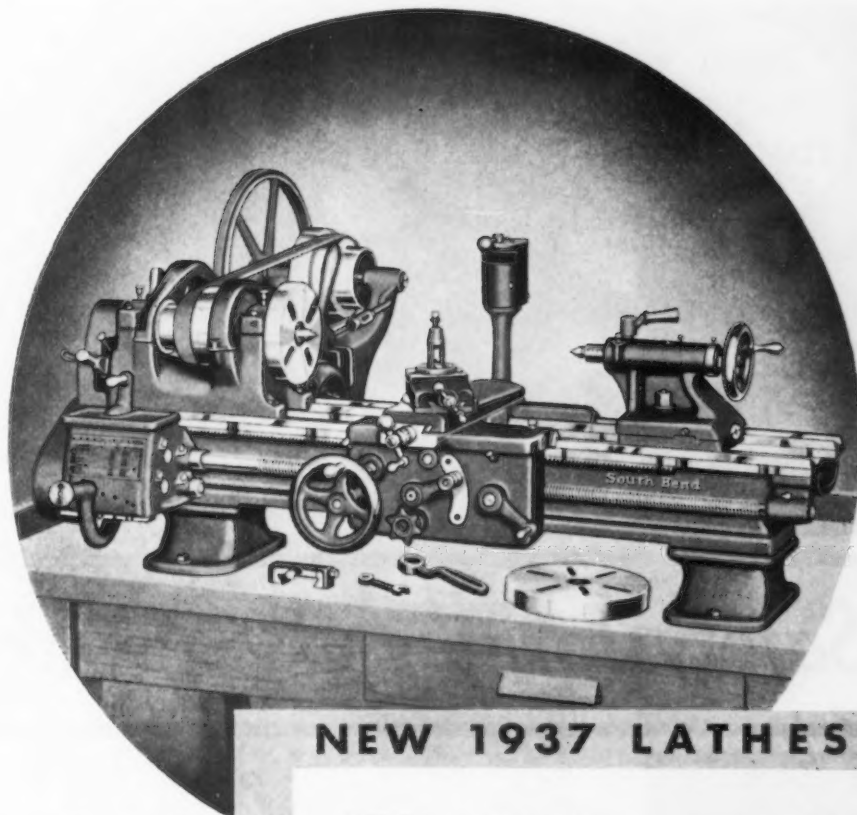
Robert T. Brooks, vice-president of the American Institute of Steel Construction, New York, emphasized a vital problem in the steel industry today—that of unfair trade practices. Laws forbidding unethical and uneconomic practices have been passed by the Government, but, said Mr. Brooks, none of them has helped steel companies themselves.

"It is clear," he said, "that we must become constructive in our thinking. We must learn to see our business picture as a whole, and not be hypnotized by selfish details. We must listen to the voice of enlightened self interest."

"Price chiseling will not always

be allowed to sap our industry. Opinion is crystallizing so fast that I believe the day of action is not far distant. Regulated, this insidious practice must be. The question is, 'shall it be regulated through self-regulation and the processes of education by business itself or through compulsion by the processes of Government?'"

The increasingly important problem of industry and labor received a major portion of attention and interest. Speaking on the subject



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THE new 1937 Series of South Bend Back-Geared, Screw Cutting Precision Lathes with Double Wall Aprons and hardened and ground headstock spindles are recommended for the finest and most accurate work in the tool room, machine shop, manufacturing plant, and laboratory. Offered in sizes from 9" to 16" swing, in bed lengths from 3' to 12', Underneath Belt Motor Drive, Countershaft Drive, and Pedestal Motor Drive.

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MODERN LATHES FOR MODERN INDUSTRY

"Labor Relations, Cooperation or Disaster," Dr. Paul F. Cadman, consulting economist, San Francisco, forcibly impressed upon his audience that chaos and insolvency will result unless industry and labor work together. In this modern age of quick communication and accessibility to the public labor is more easily organized. Union leaders, he said, are striving for higher wages or better working hours only as a side issue. Their real point is complete unionization of labor so

that eventually the standard of living may be equalized.

"It now appears that industry is caught between two great forces . . ." Dr. Cadman continued. "On the one hand is a Government imposing taxes directly and indirectly through actual levies or deficit financing. On the other hand is labor, now persuaded that it must have a greater share in the product of industry. Between these two demands, which, reduced to the simplest language are wages and taxes,

industry has the problem of meeting an economic demand which is as inevitable as the law of gravitation—namely, the cost of production.

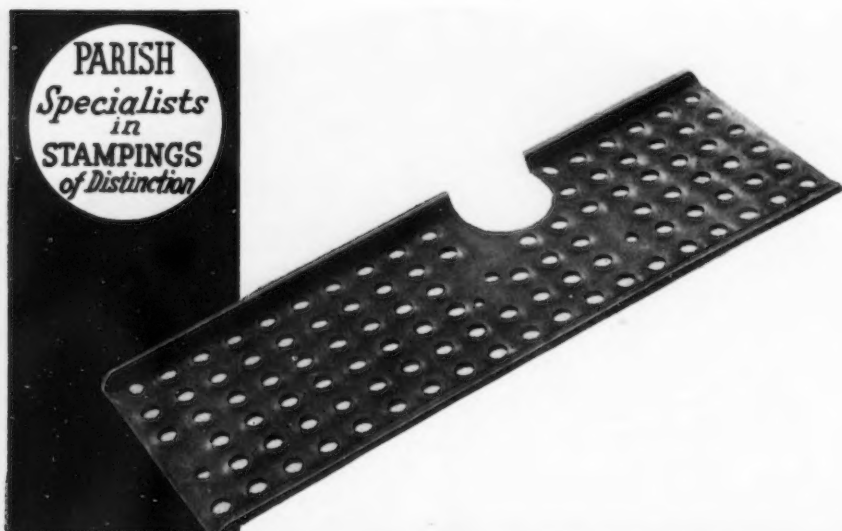
"Seated around the industrial dinner table are the lenders and donors of capital, the Government's tax collectors, the managers and the laborers. They may all reach and grab and quarrel and fight about their share, but one thing is certain; not one member of the family will have any share unless industry remains solvent. The Government under a radical philosophy could abolish the managers, confiscate the capital of the lenders and donors, run the industry for the benefit of labor, but it would still be under the necessity of meeting the cost of production and producing an increase. And labor's share would be just as definitely restricted as such a Government took larger and larger proportions of the increase to operate the State."

Group meetings were held Thursday afternoon by merchant steel dealers, reinforcing steel dealers, structural shops, tubular dealers, foundries, manufacturers, traffic and purchasing agents.

The iron and steel clinic, held Friday morning, discussed late developments in administration of State unemployment reserves act and State tax proposals and their probable effect on industry. The former was led by C. B. Tibbetts, Los Angeles Steel Casting Corp. and member of the State Unemployment Reserves Commission, and the tax discussion was led by W. L. Connolly, secretary of the governmental expenditures and taxation committee, California State Chamber of Commerce. Thorough study of all Government proposals affecting the industry was urged by these representatives in order that a protest may be made against the injurious ones.

Officers named are: E. H. McGinnis, Union Hardware & Metal Co., Los Angeles, chairman; B. J. Osborn, Moore Drydock Co., Oakland, Cal., vice-chairman; and C. S. Knight, California State Chamber of Commerce, secretary.

In connection with the conference, the Pacific Coast Fabricators' Association met at Del Monte on Feb. 11. Officers elected for the year are: Reese H. Taylor, Consolidated Steel Corp., Los Angeles, president; Paul Pigott, Pacific Car & Foundry Co., Seattle, vice-president; Charles McGonigle, Poole & McGonigle, Portland, Ore., vice-president; George H. Raitt, Steel Tank & Pipe Co. of California, Berkeley, vice-president; and Paul F. Gillespie, Judson-Pacific Co., San Francisco, secretary.



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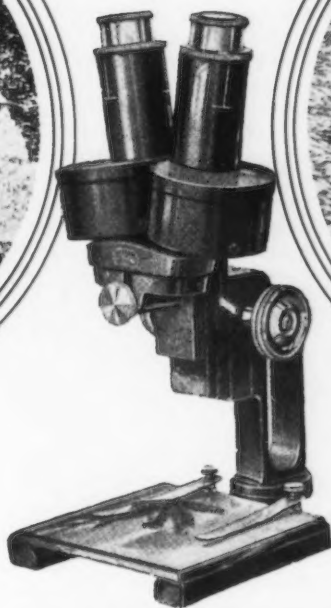
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Ross-Meehan Foundries...Chattanooga, Tenn.
Warren Foundry & Pipe Corporation.....
Phillipsburg, N. J.

U. S. Steel's Public Relations Policy Being Watched by Other Corporations

WASHINGTON, Feb. 16.—Criticism that big industries are tight-lipped in the matter of public relations has been given a most complete answer by the Carnegie-Illinois Steel Corp. So far as is known this company has done an unprecedented thing in the field of publicity in connection with hearings before the National Labor Relations Board in Washington by supplying daily a complete and official transcript of the proceedings in which the company itself is the respondent.

The object of a board complaint, issued at the behest of John L.

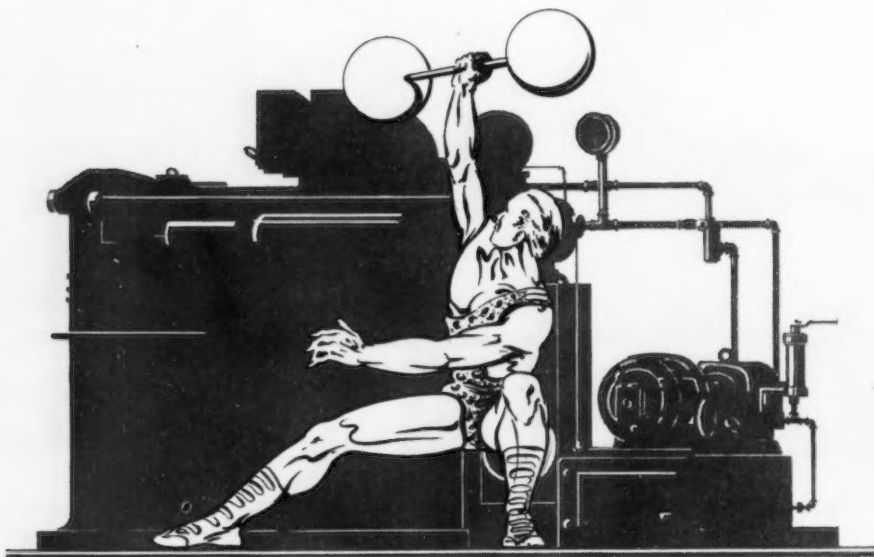
Lewis's Steel Workers' Organization Committee, the company, playing no favorites whatsoever, provides an unrivaled press service to Washington correspondents. Complete transcripts of the hearings are given out at intervals throughout each day and with them unbiased, comprehensive summaries. They accurately highlight the testimony. If the evidence is to the disadvantage of the company, and is sufficiently important, it is outlined in the press release. Should correspondents handling the material think such evidence is minimized or omitted, all they need to

do to fill in any supposed discrepancy is to turn to the attached transcript, using it according to their own judgment or convenience.

This unusual press service was inaugurated when the hearings were started and has been consistently maintained since. Consequently, it was begun when board witnesses presented their case against the company. Thus the most prejudiced big business baiter cannot in the absence of blind appeal charge the company with propagandizing the hearings. Rather, it makes clear its desire to inform the public of both sides of the case, convinced, no doubt, that if a "mandate" were based on public opinion it would be secure in its position.

This new chapter in public relations has developed widespread and favorable comment both in the press and among industrialists. It is reported that other industrial interests are considering the adoption of a like method with regard to Congressional hearings in Washington and that it may be extended in other directions where vital principles affecting the public and industry are affected.

The public relations work of the United States Steel Corp. and its subsidiaries is directed by J. Carlisle MacDonald, assistant to the chairman.



More Than A Matter of Size

Sheer size or bulkiness is no indication of the ability of a production welder to do consistently good work on heavy gauge operations. On heavy duty machines, the design problems are more difficult and the need for accuracy even greater if operating costs are to be commensurate with the job. Steel mills, with their heavy standards of weight and thickness, have always considered Thomson-Gibb headquarters for their type of welders. Before you select production welding equipment for your work, ask us to prove the advantages of Thomson-Gibb machines in terms of better production and lower cost.

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PRODUCTION WELDERS

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MANUAL AND AUTOMATIC
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New Insulating Brick By Johns-Manville

JOHNS-MANVILLE CORP. has recently placed on the market a new type of 2000-deg. insulating brick known as JM-20. This new brick was developed by the company's research laboratories for use behind refractory walls in open-hearth regenerators, in hot blast mains and bustle pipes, in producer gas mains and in various types of furnaces. It can also be used for direct exposure in radiant tube type annealing furnaces, electric furnaces or wherever there is no flame impingement, slag action or mechanical abrasion, at temperatures up to 2000 deg. F. JM-20 insulating brick is unusually light in weight, weighing less than 1.7 lb. per standard 9-in. equivalent. Its low heat capacity is less than one-quarter that of ordinary refractories, and its thermal conductivity is less than one-sixth that of fire brick.

McKeesport Merger To Be Voted March 8

THE result of the proposed merger of the McKeesport Tin Plate Co. and its subsidiary, National Can Co., will be the formation of a new company, to be known as McKeesport Tin Plate Corp., G. V. Parkins, president of the parent company, announced recently. Under the terms of the agreement two shares of the new corporation will be exchanged for each share now outstanding of the two companies. A special meeting of McKeesport stockholders has been called for March 11 to vote on the merger, while National Can's stockholders will meet March 8.

Steel Plate Orders Up 87% In 1936

NEW orders for fabricated steel plate in December amounted to 51,017 short tons, an increase of 26 per cent over November and 43 per cent over December, 1935, according to the Department of Commerce. This was the fourth largest monthly volume reported for 1936, having been exceeded by May, June and July. July bookings of 60,324 tons were the monthly peak in 1936. The December total of 51,017 tons, however, was about 26½ per cent above the year's average of 40,336 tons a month.

Total orders booked during the 12 months of 1936 came to 484,036 tons, an increase of 225,721 tons or 87 per cent over the 1935 volume of 258,315 tons.

Management Society Forms Detroit Unit

THE Detroit chapter of the Society for the Advancement of Management came into being on Jan. 25 with the election of permanent officers. Since early last fall, the nucleus of the chapter has been formed under the temporary presidency of Joseph A. Carlin, general manager, Hutto Machine Division, Carborundum Co., who had been the carry-over president from the Detroit chapter of the Society of Industrial Engineers. The S.A.M. is made up of former members of the Society of Industrial Engineers and the Taylor Society, both of which former groups have disbanded. The Detroit chap-

ter starts off with a group of about 40 men and will have sections devoted to time and motion study, production control, personnel and related management functions.

The newly elected officers are: president, E. S. Smith, plant executive, Fisher Body Corp. Plant No. 23, Detroit; vice-president, L. B. Keeler, production planning dept., Hudson Motor Car Co.; secretary-treasurer, D. J. Sublette, principal examiner, Detroit Civil Service Commission.

Drunkenness Held Just Cause for Discharge

EMPLOYEES who are discharged because of drunkenness are not entitled to benefits under the Wisconsin Unemployment Compensation Act, according to the ruling of the Industrial Commission of Wisconsin, administrator of the law, in the first contested case involving an interpretation of the



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INLAND 4-Way Floor Plate

YOU have to think of safety and economy, too, when installing floors. Inland 4-Way Floor Plate is industry's most successful answer to both needs.

You'll find it standard among leading firms... after thorough testing of all types of flooring.

You'll find it around machines, on steps, walkways, loading platforms and aisles where wheel or foot traffic is heaviest in all types of plants.

Inland originated the 4-Way Pattern for extra safety in all directions, extra stiffness, easy matching and cleaning. Write for an illustrated booklet on safer industrial floors.

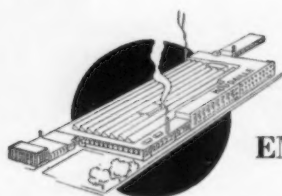


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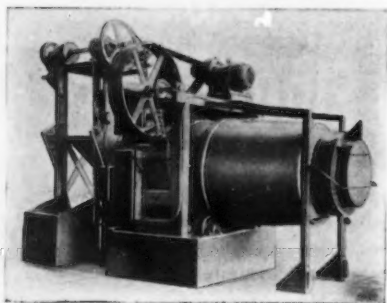
A DIVISION OF HOUDAILLE-HERSHEY CORPORATION

"justifiable discharge" clause of the act.

The action was that of Joseph Garbarczyk, aged 46, Milwaukee, against the International Harvester Co. He was employed as an elevator operator and laborer in its Milwaukee works for 11 years, and was discharged Aug. 3, 1936. His foreman testified before the commission that Garbarczyk was in-

toxicated, and that he had warned him on several previous occasions. The commission then upheld the contention of counsel for the Harvester company that workers "fired" on charges of drunkenness became ineligible for unemployment compensation benefits.

Garbarczyk contended a stomach ailment had made him ill and that he was not intoxicated by liquor.



Cascade Mill

NOT a "self-destructive" machine

This cleaning mill doesn't blast its own interior to destruction. It simply retains a moving, flowing mass of work and stars and crushed steel which, cascading upon itself, achieves a thorough, low-cost cleaning operation. It requires little power. NOT being self-

destructive, replacement of parts is necessary only at long intervals. Especially suited to cleaning castings and forgings. Built in several sizes.

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He carried his claim to the appeal board, which established the principle of the Harvester company's contention.

The appeal board was composed of Harold S. Falk, vice-president and works manager of the Falk Corp., Milwaukee; Peter T. Schoemann, president of the Milwaukee Building Trades Council and president of the Milwaukee Board of School Directors, and Marvin P. Verhulst, a representative of the Industrial Commission.

Southern Foundry Practice Meeting

THE fifth joint annual meeting of the Birmingham chapters of the American Foundrymen's Association and the American Society of Mechanical Engineers will be held in Birmingham on Feb. 25 and 26 at the Tutwiler Hotel. There will be technical sessions and a plant visitation. Guest speaker at the annual banquet, terminating the conference, will be A. M. MacCutcheon, vice-president, Reliance Electric & Engineering Co., and president of the American Institute of Electrical Engineers.

A. F. A. Convention Committee Appointed

W. F. Bornfleth, Cutler-Hammer, Inc., Milwaukee, recently appointed general chairman of the Milwaukee Convention Committee, and Walter Gerlinger, Walter Gerlinger, Inc., general vice-chairman, have announced the appointment of the various committees that will assist the American Foundrymen's Association in staging the forty-first annual convention and foundry show in Milwaukee, May 3 to 7, 1937. Chairmen of all major committees are as follow: Reception, R. S. Macpherran, chief chemist of Allis-Chalmers Mfg. Co.; plant visitation, John T. Brown, vice-president of Chain Belt Co.; ladies entertainment, William J. Grede, president of the Liberty Foundry Co.; hotel accommodations, William J. MacNeill, general manager of Federal Malleable Co.; transportation, Roy N. Jacobs, president of Standard Brass Works; publicity, Charles A. Gutenkunst, Jr., president of the Milwaukee Malleable & Gray Iron Works; golf, E. L. Roth, general manager of Motor Castings Co.; stag dinner, A. G. Ziebell, president of the Universal Foundry Co.; annual banquet, L. S. Perego, president of Sivyer Steel Casting Co.

...OBITUARY...

HARRY E. SHELDON, a founder and president of Allegheny Steel Co., died Feb. 10 after a short illness. He was 75 years old. While his activity in the company had decreased in the last several years, he remained as its president and participated in its management until just before his death. Although Mr. Sheldon's career as an industrialist was passed within 10 miles of the town of his birth, it made him one of the leading figures in the American steel industry. He was a pioneer in the production of special steels for the use of the electrical industry for over 35 years, and in the production of stainless steel in this country.

He was born in Freeport, Pa., on July 14, 1862. An orphan at the age of two, he was placed



H. E. SHELDON

in the Lawrenceville Episcopal Church Home, Pittsburgh. His schooling ended at the age of nine, when he was put to work at firing the furnaces and caring for the laundry machinery at the home.

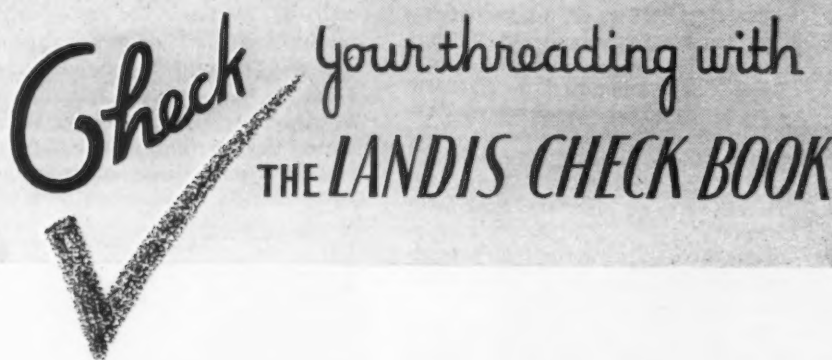
At the age of 14 he became an apprentice in a Lawrenceville machine shop at a starting wage of \$2 a week. Five years later he became a laborer in the sheet steel manufacturing plant of Kirkpatrick & Co., Leechburg, Pa., at a wage of 90c. a day. Seven years later he was superintendent of their sheet and tin mills and soon afterward became general manager of the company. In 1900 Kirkpatrick & Co. was absorbed

by American Sheet & Tin Plate Co. and in the same year Mr. Sheldon, in company with several others, founded the Allegheny Steel & Iron Co. to manufacture special steel sheets for electrical uses. The company later became Allegheny Steel Co. On Sept. 17, 1936, the various communities contiguous to the company's plants at Brackenridge and West Leechburg, Pa., celebrated a holiday, Harry E. Sheldon Day, in recognition of the philanthropies and benevolences of their leading citizen, extending over a period of more than 30 years.

FREDERICK W. JARCHO, president of the Sheriffs Wheel Co., Milwaukee, manufacturer of propeller wheels for steamships and other power

watercraft, died Jan. 29, aged 62 years. He was associated with the industry more than 40 years.

HARRY ROBLIN, president of the Buffalo Housewrecking & Salvage Co., and one of the best known scrap men in the district, died Feb. 9, in Miami, Fla. Born, Dec. 28, 1872, Mr. Roblin attended Buffalo schools, then entered business with his father who had a flourishing scrap metals business. About 33 years ago Mr. Roblin and his brother, Daniel A., formed the firm of Roblin Brothers, its first sizable job being the dismantling of the Pan-American Exposition buildings. At this time the firm merged with Lehman-Greentree Co. to assume its present name.



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LANDIS MACHINE COMPANY
Waynesboro, Penna.

MONTHLY SHIPMENTS OF FINISHED STEEL PRODUCTS BY UNITED STATES STEEL CORP.—TONS

Month	1933 Ship- ments Per Cent of Ca- pacity	1934 Ship- ments Per Cent of Ca- pacity	1935 Ship- ments Per Cent of Ca- pacity	1936 Ship- ments Per Cent of Ca- pacity	1937 Ship- ments Per Cent of Ca- pacity
January	285,137 17.7	831,777 19.8	534,055 31.9	721,414 44.8	1,149,918 *73.9
February	275,929 18.5	385,500 25.9	583,137 39.2	676,315 45.3	.....
March	256,793 15.3	588,209 35.2	668,056 41.5	783,552 50.5	.....
April	335,321 21.6	643,009 41.5	591,728 36.7	979,907 63.2	.....
May	455,302 27.1	745,063 44.5	598,915 35.8	984,097 63.4	.....
June	603,937 37.4	985,337 61.2	578,108 36.7	886,065 57.1	.....
July	701,322 45.1	369,938 23.9	547,794 34.0	950,851 61.3	.....
August	668,155 39.8	378,023 22.6	624,497 37.3	923,703 59.6	.....
September	575,161 35.6	370,306 23.9	614,933 39.7	961,803 62.0	.....
October	572,897 35.5	343,962 20.6	686,741 41.1	1,007,417 62.6	.....
November	430,358 26.7	366,119 22.7	681,820 42.3	882,643 59.2	.....
December	600,639 38.7	418,630 27.0	661,515 42.7	1,067,365 68.8	.....
Plus or minus yearly adjust- ment	(+44,283) ...	(-19,907) ...	(-23,750) ...	.....	.....
Total for year	5,805,235 30.1	5,905,966 30.6	7,347,549 38.1	10,825,132 58.2	.....

* As based on capacity at Jan. 1, 1936.

Steel Corporation's Shipments for January High for Month Since 1929

SHIPMENTS of finished steel products by subsidiary companies of the United States Steel Corp. amounted to 1,149,918 tons in January, the highest January total since 1929, when 1,267,823 tons was shipped. Last month's shipments were 82,553 tons over December and 428,504 tons over January, 1936. The month's shipments also exceeded every preceding month since May, 1930, when the total was 1,203,916 tons.

In order to produce the amount of steel shipped, the corporation's finished steel making facilities would have had to operate during January at an average rate of 73.9 per cent of capacity, as calculated from the rated capacity existing at January 1, 1936. This contrasts with the December rate of 68.8 per cent and the January, 1936, rate of 44.8 per cent.

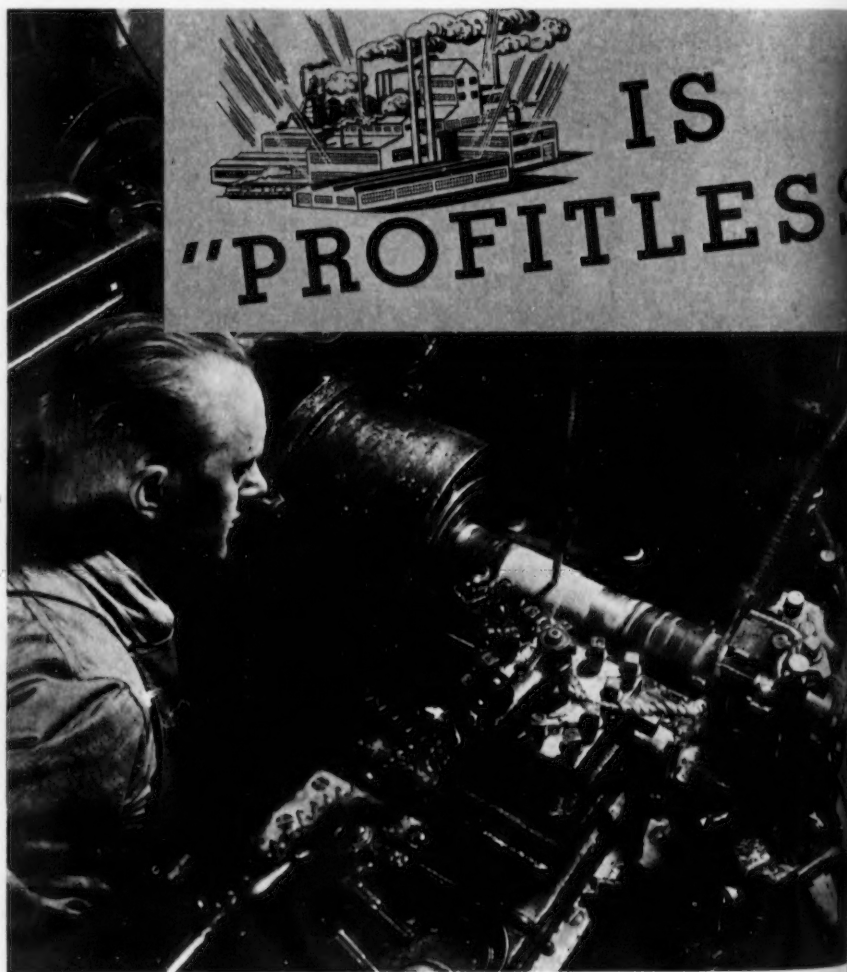
The increase in the January shipments over December is partly attributable to orders placed before price advances became effective.

Increased Production Of Magnetic Alloys

THE demand for special high strength magnetic alloys—alni, alnico and the like—has now increased to such a point that the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., has built a new plant for the regular production and testing of these alloys. In the newly equipped plant division, quality control facilities for casting, heat treatment and testing to assure greater uniformity of physical and magnetic properties have been extended well beyond previous standards, according to the company. As a result, castings of the new alloys

will be available to meet strict mechanical and electrical specifications—solid throughout, free from surface defects, and uniform in structure and properties. Magnetic testing equipment of the newest type will be utilized in a

rigorous production test routine on the entire output of the new magnets. Combined with the new testing routine, the new facilities are expected to permit wide expansion in the use of alni and alnico in equipment where magnetic properties are critical. Magnet designs heretofore difficult or impossible to cast successfully from the new alloys may also be produced, according to a company statement.



IS
"PROFITLESS"



..PERSONALS..

C. W. HEPPENSTALL, president and treasurer of the Heppenstall Co., Pittsburgh, was the guest of honor on Feb. 15 at a dinner given by his employees in celebration of his 44 years of service with the company. He is the fourth generation of Heppenstall steel men whose name has been associated with the progress of steel in England and America for 145 continuous years. He first became identified with the steel industry at an early age as a broom boy sweeping dust from hot sheets. He later became an assistant roller and then roller. Seeking more education, he left work to attend Indiana State Normal School and Pennsylvania State College. During the panic of the early nineties, his father, Sam Heppenstall, was no longer able to help him in school and he returned to Pittsburgh, where he got a job on a road gang project financed by

Andrew Carnegie to make work for the unemployed. In 1893 he joined the Trethewey Mfg. Co., predecessor of the Heppenstall Co., which



C. W. HEPPENSTALL

had been organized by his father four years before. From office boy, he was soon transferred to work in the mill. Within six years he was appointed general superintendent, and two years later he was made

general manager. He has been president of the company since 1920.



DON J. LUTY has been named assistant general manager of the air conditioning division of Gar Wood Industries, Inc., Detroit. Mr. Luty has been connected with the company for many years in the capacity of chief engineer. NORMAN SAYLOR has been appointed manager of the Detroit branch. Mr. Saylor joined the air conditioning division last year and has devoted his entire time to branch sales promotion work.



H. G. McILVRIED has been appointed assistant to the manager of operations, Pittsburgh district, Carnegie-Illinois Steel Corp. He will have supervision over the sheet and tin plate developments in the Pittsburgh district. Mr. McIlvried's long service record with subsidiaries of the United



H. G. McILVRIED

PROSPERITY" JUST AROUND THE CORNER?

Remember 1925 when plants were busy yet making but little profit? If costs continue to rise, we may be in for the same thing again. There's a way to continue at a profit in spite of rising material prices and wage rates:—

1—cut material waste (Warner & Swasey Turret Lathes reduce scrap loss, save material by reducing handlings—in one case material used was cut 30%).

2—get more efficiency in production (Warner & Swasey Turret Lathes reduce operator fatigue and error, speed output—in many cases cut cost per piece 50%).

The arithmetic of profit is simple—keep costs down. Warner & Swasey has helped hundreds of plants do it. You can have the benefit of this specific experience. Write

WARNER & SWASEY, CLEVELAND

**WARNER
&
SWASEY**
Turret Lathes
Cleveland

States Steel Corp. began in the Braddock works of the American Steel & Wire Co., where he was a machinist. He went to the Rankin works as a draftsman from Braddock and later returned to the Edgar Thomson works at Braddock in a similar capacity. He was construction engineer of the National Tube Co. before going to the American Sheet & Tin Plate Co. in 1907. Later he became chief engineer and assistant to the vice-president in charge of operations of this company. He was made assistant manager of operations, Chicago district, at the time of the merger creating the Carnegie-Illinois Steel Corp.

B. M. LIVEZEY, who has been assistant general superintendent of the Clairton steel works and coke plant, has been made assistant to the manager of operations, Chicago (CONTINUED ON PAGE 89)



There must be something unusual about a service which holds customers fifty years and longer —
Try it!



CLARK BROS BOLT CO.

Milldale, Conn.

The Economics of the Iron and Steel Industry

(CONCLUDED FROM PAGE 38)

nonpolitical fact-finding commission be established, staffed with men qualified by economic, statistical, accounting, and engineering training and versed in the complex-

ities of the industry; that it be vested with authority to prescribe and collect the type of information required; that it be authorized to make public the information col-



INDEPENDENT

operation at the correct and most economical working pressure for each machine means improved operation and efficient use of compressed air power.

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lected in any form that will not explicitly identify a given establishment; that it be directed to hold public hearings and summon thereto representatives of all affected groups; and, finally, that it be charged with the responsibility of preparing, on the basis of its examination of the problem, a report to Congress with detailed and summary recommendations concerning an effective public policy toward the price problem in the iron and steel industry.

Only in this way can we expect to make a definitive settlement of a problem that has for decades vexed both government and industry, a problem that lies at the center of the whole complex of problems concerned with the mutual adjustment of our legal theory and the economic practices of concentrated, large-scale industry.

Malleable Castings Output Shows Gain

PRODUCTION of malleable iron castings in December totaled 61,674 short tons, compared with 50,934 tons in November and 45,598 tons in December, 1935, according to Department of Commerce figures. During the month the industry operated at 73.5 per cent of capacity, against 62.3 per cent in the preceding month and 55 per cent a year ago. Total production for all of 1936 was 571,696 tons, compared with 466,395 tons for 1935, an increase of 105,301 tons, or about 22½ per cent.

Orders for malleable castings totaled 67,035 tons in December, 58,152 tons in November and 42,573 tons in December, 1935. Total for the year was 576,334 tons, against 452,611 tons for 1935, a gain of 123,723 tons or over 27 per cent.

The total 1935 production of these castings, being the production for sale as opposed to production both for sale and consumption in the same plants, which is shown by the above figures, was 433,407 tons, according to a special preliminary release based on the recent Biennial Census of Manufactures. This output represented an increase of 44.9 per cent over the 1931 production of 299,206 tons, and was valued at \$50,470,408 against \$35,294,201 for 1931. The 1929 census showed production for sale of 735,225 tons, valued at \$101,108,837.



FINANCIAL NOTES

Pittsburgh Coke & Iron Co., Pittsburgh, has filed registration statement with the SEC covering \$3,000,000 of 4½ per cent first mortgage bonds, Series A, due 1952; 20,000 shares of \$5 cumulative convertible preferred stock; 340,000 shares of common stock; and common stock scrip, 1948 series, for 300,000 shares to be issued in lieu of fractional shares.

Stanley Works, New Britain, Conn., reports for 1936 net income of \$1,868,251, or \$3.51 a share, against \$1,377,700 for 1935, or \$2.43 a share.

Sivyer Steel Casting Co., Milwaukee, reports for 1936 net income of \$147,991, or \$1.85 a capital share, against \$36,906, or 46c. a share, for 1935.

Wickwire Spencer Steel Co., New York, including Wickwire Spencer Sales Corp. and American Wire Fabrics Corp., showed profit in 1936 of \$431,384 after franchise taxes, depreciation, interest and other charges. This compares with net loss in

1935 of \$53,146. Plan of reorganization of the company will be voted on at a stockholders' meeting on March 2. It is proposed to reduce capitalization and make certain other changes in the company's financial set-up.

Rustless Iron & Steel Corp., Baltimore, has filed statement with the SEC disclosing that American Rolling Mill Co. owned or had contracted to purchase 403,700 shares, or approximately 47.8 per cent, of the outstanding common stock of Rustless Iron & Steel on Feb. 8, 1937. At Feb. 1, 1937, Armco owned 178,700 shares of Rustless Iron & Steel common and had contracted for another 225,000 shares. Purchase of the latter shares is expected to be consummated this month. Proceeds from sale will be used to pay off \$275,000 first mortgage note; to reimburse company company for \$625,000 of additions and improvements and \$36,250 of engineering fees; and to allot \$100,000 to develop a domestic source of supply of chrome ore. Company's net income in 1936 was \$350,707 after all charges and Federal taxes.

Continental Can Co. reports for 1936 net profit of \$9,038,788 after all charges, including income and undistributed profits taxes. Earnings equaled \$3.17 a common share. The net profit in 1935 was \$11,233,578, or \$4.21 a share. Company officials blamed the Robinson-Patman Act for the reduced earnings in 1936.

Conventions

March 1 to 5—American Society for Testing Materials, regional meeting and spring committee meetings, Palmer House, Chicago. C. L. Warwick, 260 South Broad Street, Philadelphia, secretary.

March 3 and 4—Electrodepositors' Technical Society, first international conference, British Industries House, London. H. Wynne-Williams, 12A, Raleigh House, Larkhall Estate, London S.W. 8, honorary secretary.

March 10 and 11—Institute of Metals (British) Annual meeting, Institute of Mechanical Engineers, London. G. Shaw Scott, 36 Victoria Street, Westminster, London S.W. 1, secretary.

Reflecting an increase of 70 per cent, the total value of metal doors, frames, window sash, etc., manufactured in 1935 was \$22,740,129, f.o.b. factory prices, compared with \$13,376,591 in 1933, according to the Bureau of the Census. Wage earners in 1935 numbered 4525, an increase of 26.7 per cent over 3572 reported for 1933, and their wages, \$5,093,031, exceeded the 1933 figure, \$3,123,156, by 63.1 per cent.

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WELLSTON

OHIO

Exports Higher — Imports in Slight Decline

Exports (In Gross Tons)	December		Twelve Months Ended December	
	1936	1935	1936	1935
Pig iron	3,091	1,066	5,316	4,107
Ferromanganese and spiegeleisen	13	....	466	131
Other ferroalloys ¹	382	....	2,486	....
Iron and steel scrap	103,298	142,135	1,831,983	2,044,506
Tin plate scrap	582	2,673	14,375	34,928
Waste-waste tin plate	5,146	3,572	44,673	24,525
Pig iron, ferroalloys and scrap	112,512	149,446	1,949,299	2,108,197
Ingots, blooms, billets, sheet bars	2,359	732	21,400	39,782
Skelp	4,368	3,290	70,157	64,421
Wire rods	1,467	2,943	34,872	26,090
Semi-finished steel	8,194	6,965	126,429	130,293
Bars, concrete reinforcement ²	721	....	3,592	....
Bars, other steel	5,778	3,652	52,061	55,105
Iron bars	54	150	1,010	1,200
Plates, iron and steel	22,342	5,701	99,282	45,889
Sheets, galvanized steel	6,250	7,791	61,455	73,056
Sheets, galvanized iron	244	154	1,753	1,948
Sheets, black steel	10,489	7,671	140,157	100,483
Sheets, black iron	308	94	6,962	5,184
Hoops, bands, strip steel	5,220	3,401	61,911	44,655
Tin plate and taggers' tin	24,360	18,923	235,583	132,276
Terne plate (including long terne)	306	102	3,298	2,234
Structural shapes, plain material	7,275	4,079	62,077	36,656
Structural material, fabricated	3,315	684	22,295	14,980
Sheet piling	55	335	2,830	4,827
Tanks, steel	1,794	2,025	21,574	8,692
Steel rails	4,835	7,120	73,455	51,672
Rail fastenings, switches, spikes, etc.	1,028	1,354	12,901	10,293
Boiler tubes	614	530	7,385	8,642
Casing and oil line pipe	5,118	1,857	32,323	26,442
Pipe, black and galvanized, welded steel	3,593	2,558	21,408	33,044
Pipe, black and galvanized, welded iron	273	374	3,797	3,349
Plain wire	5,389	3,177	47,358	39,060
Barbed wire and woven wire fencing	5,145	3,411	36,647	34,143
Wire cloth and screening	119	103	1,130	1,041
Wire rope	292	259	3,256	4,039
Wire nails	890	1,055	7,799	11,140
Other nails and tacks	375	296	3,291	3,701
Other wire and manufactures	832	1,117	5,259	5,941
Bolts, nuts, rivets and washers, except track	734	481	6,764	6,372
Other finished steel	231	171	2,202	1,526
Rolled and finished steel	117,979	78,625	1,040,815	767,590
Cast iron pipe and fittings	2,476	511	19,982	17,512
Malleable iron screwed fittings	380	283	3,657	3,466
Carwheels and axles	1,152	2,143	8,299	18,411
Iron castings	742	675	7,072	9,161
Steel castings	308	132	3,282	2,682
Forgings	413	489	3,859	6,293
Castings and forgings	5,471	4,233	46,151	57,525
Total	244,156	239,269	3,162,694	3,063,605

Imports (In Gross Tons)	December		Twelve Months Ended December	
	1936	1935	1936	1935
Pig iron	10,423	16,289	165,909	130,937
Sponge iron	55	176	1,950	1,460
Ferromanganese ¹	3,675	....	30,396	....
Spiegeleisen	3,860	4,186	52,018	54,007
Ferrochrome ²	21	21	67	32
Ferrosilicon ³	50	98	526	781
Other ferroalloys ⁴	....	....	526	1
Scrap	14,070	10,970	142,245	64,733
Pig iron, ferroalloys and scrap	32,154	31,740	393,637	251,951
Steel ingots, blooms, etc.	1	40	84	2,085
Billets, whether solid or hollow ⁵	100	....	945	....
Wire rods	1,386	1,287	18,911	16,781
Semi-finished steel	1,487	1,327	19,990	18,866
Concrete reinforcement bars	254	362	3,769	3,108
Hollow steel bars	125	83	1,930	1,172
Merchants steel bars	3,476	2,586	40,412	24,777
Iron slabs	....	....	14	....
Iron bars	61	480	1,408	1,854
Boiler and other plate	....	140	421	681
Sheets, skelp, and saw plate	1,489	1,052	22,609	11,054
Die blocks or blanks, etc. ⁵	7	....	184	....
Tin plate	46	6	234	188
Structural shapes	5,303	4,414	59,072	40,397
Sheet piling	....	978	2,512	1,203
Rails and track material	597	703	7,767	5,658
Welded pipe	466	511	5,636	4,764
Other pipe	1,525	1,712	29,461	15,822
Cotton ties	....	....	1,680	8,136
Hoops and bands for baling	1,670	2,140	24,015	22,446
Barbed wire	1,529	2,192	15,237	24,946
Round iron and steel wire	417	337	4,962	3,924
Telegraph and telephone wire	....	....	38	38
Flat wire and steel strips	289	192	2,886	1,888
Wire rope and strand	180	278	2,421	2,141
Other wire	259	145	2,042	1,360
Nails, tacks and staples	704	2,114	20,952	21,319
Bolts, nuts and rivets	23	22	516	296
Horse and mule shoes	61	38	426	590
Rolled and finished steel	18,481	20,485	250,604	197,762
Malleable iron pipe fittings	32	....	199	46
Cast iron pipe and fittings	225	....	928	76
Castings and forgings	205	126	1,480	1,314
Total	52,584	53,678	666,838	470,015

¹ Manganese content. ² Chrome content. ³ Silicon content. ⁴ Alloy content. ⁵ New classes. No comparable figures for previous year.

EXPORTS of iron and steel products, excluding scrap, during December totaled 135,130 gross tons, compared with 90,889 in the corresponding month last year. Tin plate continued to be in the lead, amounting to 24,360 tons, compared with 18,923 tons in December, 1935; plates also established a record, at 22,342 tons.

Exports of rolled and finished steel in 1936 reached a high of 1,040,815 tons, against 767,590 tons in 1935. Total scrap exports in the same period declined to 1,941,031 tons from 2,103,959 tons in 1935. Last year tin plate was the leading export item, at 235,583 tons, compared with 132,276 in 1935.

Imports of semi-finished and finished iron and steel products during 1936 reached 524,493 gross tons, valued at \$21,908,693, in comparison with 405,282 tons, valued at \$16,978,514 in the preceding year, according to preliminary statistics of the Metals and Minerals Division, Department of Commerce. Pig iron was the chief item imported during 1936 on a quantity basis and totaled 165,909 tons. Structural shapes was next and totaled 59,072 tons.

December Imports of Pig Iron by Countries of Origin

	Twelve Months Ended December			
	1936	1935	1936	1935
United Kingdom	....	675	5,286	14,500
British India	4,750	4,704	55,527	36,162
Germany	200	1,450	4,749	4,877
Netherlands	1,898	7,025	60,363	48,122
Canada	367	694	10,671	13,771
France	....	....	....	50
Belgium	....	....	973	100
Norway	100	25	2,649	2,420
Sweden	....	....	689	907
Russia	3,108	1,716	24,556	9,124
All others	....	....	446	904
Total	10,423	16,289	165,909	130,937

December Imports of Iron and Manganese Ores

	Iron Ore		Manganese Concentrates, 35 Per Cent or Over	
	1936	1935	1936	1935
Canada	105	90	....	....
Cuba	33,000	32,000	5,289	....
Chile	107,100	65,225	....	....
Spain	....	....	....	....
Norway	20,837	22,979	....	....
Sweden	20,885	....	....	....
French Africa	....	....	....	....
Russia	....	7,850	15,663	1,906
India	....	....	8,559	....
Brazil	....	....	3,885	6,633
Gold Coast	....	....	11,744	3,851
Other countries	6,584	9,428	17	593
Total	188,511	137,572	45,157	12,984

Arbitration Journal Makes Debut

THE American Arbitration Association has issued the first number, in January, of a publication which will be known as *The Arbitration Journal*.

This publication will be a quarterly, will have international news and comments, and will tell the story of arbitration in foreign and domestic trades and in commercial, legal and labor problems. Each number will contain a symposium presenting a picture of arbitration in some important field of industry. The first symposium is devoted to arbitration in the insurance groups.

This journal should bring to members of the metal trade much information which may prove of real value in solving their problems and in maintaining friendly relations throughout the industry.

PERSONALS

(CONTINUED FROM PAGE 85)

district. He has been associated with the company since 1916, when he was graduated from Lafayette College with a degree in chemical engineering.

HERMAN SCHIFFLIN, manager of the mining machinery and crusher department, Allis-Chalmers Mfg. Co., Milwaukee, has returned from an extensive tour of observation and investigation of business prospects in the Philippine Islands, with particular reference to gold mining.

R. B. RENNER, who has been identified for the past 20 years with the New York office of the Jeffrey Mfg. Co., Columbus, has been made chairman of the executive committee of the materials handling division of the American Society of Mechanical Engineers.

HOWELL C. CUNNINGHAM, since 1912 secretary of the Crucible Steel Casting Co., Lansdowne, Pa., has been elected vice-president and treasurer. H. L. MCCLEES, who has been connected with the company since 1918, has been elected secretary.

JOHN H. ELLIOTT has been appointed assistant general superintendent at the Shenango works of Carnegie-Illinois Steel Corp. Mr. Elliott went to the Shenango works in 1926 as combustion engineer. He was made superintendent of the an-

nealing department in 1932, and last August was named acting master mechanic. He entered the employ of the American Sheet & Tin Plate Co. at Pittsburgh in 1919 in the engineering department.

GEORGE FURMAN, formerly identified with the Beardsley & Piper Co., Chicago, has returned to the organization to handle a part of its Eastern sales territory in Pennsylvania and New York. S. S. SWASEY has joined the sales en-

gineering staff and will be available for consultation and engineering service in all territories. J. J. WALSCH has become associated with the company as a demonstrator.

C. C. PINCKNEY, who joined A. Milne & Co., New York, in 1933 after 15 years with the Bethlehem Steel Co., has been appointed assistant manager of the New England district of the Milne company, with headquarters in Boston.



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Steel Shortage Delays Navy Program; Conference Held on Walsh-Healey Act

WASHINGTON, Feb. 16.—Strong opposition to granting exemptions from the Walsh-Healey Government Contracts Act to the steel industry in bidding on Federal requirements was registered by organized labor forces at a conference they held here yesterday with Department of Labor officials. Called at the request of labor leaders of both the American Federation of Labor and the Committee for Industrial Organization, the conference was presided over by Assistant Secretary of Labor Edward F. McGrady, who said he was hopeful of a satisfactory settlement of the situation. He did not indicate upon what terms an agreement might be reached with steel makers.

So acute has become the situation that President Roosevelt has taken a hand in it and asked for reports on it from the Navy and Labor departments. Shortage of steel is delaying the naval ship-building program, immediately affecting the construction of six destroyers and three submarines, and the responsibility is placed by the Navy Department on the Walsh-Healey Act. Steel producers have declined to submit bids because of the strict requirement of the act for a 40-hr. week and 8-hr. day. They contend that, if compelled to adhere rigidly to these hours, they would be placed at a competitive disadvantage with steel producers who are engaged exclusively on private contracts. They explained their position at a conference in Washington on Jan. 26 with Labor Department and Navy officials.

The Navy Department asked that exemptions be granted in order that it might obtain 25,000,000 lb. of strips, plates and structural shapes urgently needed for vessels whose construction have been delayed with a threat of holding up construction of other vessels and of widespread unemployment in Navy yards.

Walsh Defends Steel Industry

Coming on the heels of organized labor's attack on the steel industry and its insistence on no exemption came a surprise attack from one of the co-authors of the act, Senator David I. Walsh, chairman of the Committee on Naval Affairs. A strong supporter of organized labor, Senator Walsh repudiated its attitude and criticized the Department of Labor for its administration of the law. He

declared that unless exemption is granted the steel industry, Congress will undoubtedly have to modify the law insofar as purchasing of supplies for national defense is concerned. The real difficulty, said Senator Walsh, is not the terms of the act, but the administration of the act. He pointed out that it gives ample discretionary power to purchase the Navy's steel requirements. His remarks were inspired by the impasse over the steel supply situation which had been discussed at the conference between labor leaders and Department of Labor officials.

The Senator explained that the Navy received bids for only 7,000,000 lb. of the 25,000,000 lb., for which it had advertised and rejected those that were submitted.

"The reason for the lack of bidders is that the Department of Labor . . . imposed terms for the 40-hr. week at this time," said Senator Walsh.

To Describe Metal Cutting Research

RECENT activity of the A.S.M.E. special research committee on the cutting of metals, which for four years has been active in extending the pioneer work of Frederick W. Taylor, will be described by R. C. Deale, secretary of the committee, at a meeting of the Metropolitan Section of the American Society of Mechanical Engineers, to be held the evening of March 2.

The special committee, which is headed by L. P. Alford, has in preparation a "Cutting of Metals Handbook," the final draft of which will be submitted soon to the A.S.M.E. Research Committee for acceptance and publication. The data which form the basis of the text of the handbook have been drawn from many sources. The committee first reviewed the experimental data developed during the past 30 years in Europe and the United States, and then conducted a series of original measurements on the cutting of cast iron and steel at the Stevens Institute of Technology. Other data have been contributed by the management of many of the largest and most progressive shops in various parts of the country. The text of the handbook has been revised and

"The steel industry has been operating under a 44-hr. week and claims to be unable to readjust its operations to a 40-hr. week at this time.

"The real difficulty, therefore, is not the terms of the act, but in the administration of the act, the Labor Department being in conflict with the steel industry. The act gives ample discretionary power to the Department of Labor in various industries.

"Unless some satisfactory adjustment is reached, Congress will undoubtedly take steps to remove or modify the operation of this law insofar as purchasing supplies for national defense is concerned."

The position of organized labor leaders is that if the steel industry is granted exemptions the purposes of the Walsh-Healey act will be destroyed. They insist that, despite the fact that the steel industry is a continuous industry, it can adjust its operations, without injuring its competitive position, to the terms of the act. They contend that the industry is reflecting an unpatriotic spirit in refusing to supply the Navy with pressing needs for its building program.

rewritten a number of times with a view to making it a worthy continuation of Mr. Taylor's "Art of Cutting Metals," originally published by the A.S.M.E. in 1907.

Thomas Steel Co. Buys Cold Mill

THOMAS STEEL CO., Warren, Ohio, has awarded a contract to United Engineering & Foundry Co., Pittsburgh, for a four-high single stand 24-in. reversing cold mill.

Steel Castings Orders Set a Near-Record

ORDERS booked for commercial steel castings for December totaled 159,430 net tons, the highest monthly figure, with one exception, since 1920, according to the Department of Commerce. The plants covered in these monthly reports produce approximately 90 per cent of the total value of steel castings made for sale, as reported at the Census of Manufactures for 1933.

Orders booked for the year 1936 totaled 909,080 net tons, compared with 400,157 in 1935. During 1936 production totaled 805,691 tons, compared with 398,988 in the previous year.

All Steel, Welded, Ferry to Have Speed Of 60 Miles Per Hour

A SHIP, 300 ft. long and 100 ft. wide, which will have a speed of 60 miles per hr., has been designed for the proposed Michigan-Illinois ferry by the Gil-Boat Co., Holland, Mich., according to a statement by M. L. Gilbert, president.

Powered by high speed turbines developing 24,000 hp., this boat will be streamlined to reduce air currents, and will be all steel, all welded and fireproof. Constructed on the patented Gil-Boat design, the ship planes with nominal horsepower, and skin friction is reduced to a minimum. By using Dow metal for all girders, braces, beams, carlins partitions, bulkheads, etc., the normal weight of the ship has been reduced from over 3000 tons to about 1100 tons. Built with very light draft, the makers claim this type of ship is almost impossible to ground, being capable of backing off a sand beach even when grounded at full speed.

The Gil-Boat Co. now has contracts for five ships of this design, which will be built with speeds

of from 40 to 50 miles per hr. and are said to be the fastest working ships in the world.

Research Spending to Total \$250,000,000

INDUSTRY'S 1937 appropriations for research will exceed \$250,000,000, according to Dr. E. R. Weidlein, president of the American Chemical Society.

"During 1936," stated Mr. Weidlein recently, "the steel industry spent \$9,200,000 on research activities—\$500,000 more than during the preceding year. Scientific research is still young, even in the life of the universities, which are primarily responsible for its existence. Having gained the spirit of research from the universities, the industries have applied its methods to their own affairs with really amazing results. During the last 25 years the number of industrial research laboratories in the United States has grown from a very few to more than 2000.

"Since 1870," according to Mr. Weidlein, "science applied to manufacturing has created 18 new industries that furnish direct and

indirect employment to over 10,000,000 persons. Science has also effected a fourfold increase in our standard of living since 1790, and many of the good things of life, including automobiles, radios, telephones, and electric lights, are direct scientific creations."

Westinghouse to Hold Machine Tool Meeting

WESTINGHOUSE ELECTRIC & MFG. CO. will sponsor a second machine tool electrification forum at its East Pittsburgh works April 19 to 22. The forum will discuss "New Methods and Designs for Machine Tool Electrification." The increasing demand of industry for more accurate control will make this meeting of interest to all machine tool manufacturers.

Papers on the subject of special and difficult problems will be presented by representatives of machine tool builders as a special feature of the forum. Talks will also be given by Westinghouse works, application and design engineers. Inspection trips through the East Pittsburgh and Nuttall works will be included in the program.

At the first machine tool electrification forum of last June there was a total attendance of over 60 and an average daily group of more than 30 delegates. The success of this meeting is responsible for the second forum which will embrace an even more elaborate program.

Armco Stainless Sales Double

SHIPMENTS of stainless steel by the American Rolling Mill Co. in 1936 were double those of 1935, according to W. W. Sebald, vice-president. Indications are, he added, that 1937 sales will be twice those of last year.

Mr. Sebald said Armco had installed equipment in its Butler, Pa., plant for the polishing of stainless steel to augment that now in use in Middletown.

German Steel Output Higher in 1936

RAW steel production in Germany in 1936 increased by 2,739,000 tons to 19,158,000 tons. The output of rolling mills in 1936 totaled 13,389,000 tons, an increase of 1,970,000 tons compared with 1935.

VIEW of the flood-wrecked offices that were a common sight in flooded areas along the Ohio River. The steel desk with opened drawers and mate behind it successfully withstood "Old Man River". After being cleaned up, both are again in use. They are the only pieces of furniture in this office not completely ruined. (Photo by Globe-Wernicke.)



Sheet & Tube Buys Two Piercing Mills

YOUNGSTOWN Sheet & Tube Co. has awarded a contract to the Aetna-Standard Engineering Co., Youngstown, for two piercing mill units that are to be installed at its seamless pipe mill at its Campbell Works, to replace the Pilger mill equipment. The installation of this new equipment is part of the company's improvement program announced in December.

Prizes for Design of Steel Highway Bridge

THE ninth annual design competition of the American Institute of Steel Construction, 200 Madison Avenue, New York, is now being announced to engineering and architectural students in colleges and universities throughout the United States. The subject of the contest is a steel highway bridge, and designs must be submitted before April 12, 1937.

Three cash prizes will be awarded by a jury of nationally known authorities. The design selected as the best will receive an award of \$150; the second best, \$100; and the third, \$50.

Pennsylvania House Hearing New Tax Bill

PENNSYLVANIA corporations will be required to pay millions of dollars in additional taxes on capital stock, if a bill now on the floor in the State Legislature and backed by Governor Earle is passed, according to dispatches from Harrisburg.

The bill proposes to remove the exemption which companies chartered in the State have been allowed upon majority-controlled stock they own in subsidiaries where such stock represents property situated outside of Pennsylvania. Thus, steel, oil and coal companies, which have Pennsylvania charters, will be forced to pay taxes on any other properties they control regardless of where situated, whether in this country or abroad. Reports have been circulated to the effect that several important concerns plan to move from the State should the bill be approved.

Known as the Cohen bill, it is said that this proposal would do much to eliminate any budget defi-

cit for the present biennium or for the biennium to come.

A spokesman for the Pennsylvania Manufacturers' Association said in reference to the measure, "The removal of this exemption will mean that any Pennsylvania company having a large interest in wholly owned or controlled affiliate companies will be compelled to reorganize and either seek a charter in another State or take other steps so as to be relieved of the excessive tax burden which will be imposed."

World Steel Meeting To be Held Here

AN international conference of delegates from all steel-producing countries will be held in New York June 28 to July 3. The American Institute of Steel Construction, 200 Madison Avenue, New York, will be host. This will be the sixth International Congress for Steel Development. Five similar conferences held during the five previous years have all met in Europe, the last in Berlin, Germany, in 1936. The purpose of these conferences is the exchange of information regarding improved methods of applying steel to construction and other uses, its object being to make the material better adapted to all the uses for which it is intended.

Farm implement manufacturers in Illinois employ 55,000 persons, according to a recent survey made by the Illinois Manufacturers' Association.

HOW TO WELD 29 METALS

THE material which has appeared in current issues of The Iron Age under this title has brought to us many requests for reprints. The Iron Age is not in a position to supply these reprints, but they have been made available by Westinghouse in convenient book form, 5 1/4 by 8 1/2 in. in size, at 50c. per copy. Copies may be obtained from the nearest Westinghouse welding distributor, Westinghouse district offices, or by writing to the Westinghouse Electric & Mfg. Co., Dept. 5-M, East Pittsburgh, Pa.

The material covers the welding of 29 different metals, types and sizes of electrodes, current frequencies for best results, heat treatment, strength and physical properties of welds and a host of similar data.

Ship Launchings Show Gain in 1936

IN 1936, total tonnage of merchant vessels launched throughout the world increased more than 60 per cent as compared with 1935, according to a statement just issued by Lloyd's Register of Shipping.

Launchings during 1936 aggregated 2,117,924 gross tons, the largest since 1930, and a gain of 815,000 tons over 1935. The gain for the year, incidentally was the largest reported since 1919. All the leading maritime nations except Denmark, France and Italy show advances in tonnage launched over last year. Great Britain and Ireland showed a gain of 357,000 tons, Germany, 153,000 tons, and Japan, 148,000 tons. The United States increased output 79,000 tons, Holland, 36,000 tons and Norway, 7000 tons.

Comparative increases for the past two years for the United States, Great Britain and other countries are as follows:

	1936	1935
Great Britain and Ireland	856,257	499,011
United States	111,885	32,607
Other countries	1,149,782	770,462
World total	2,117,924	1,302,080

Great Britain and Ireland continue to increase their lead in shipping output over the United States, the report states. Before the War, American shipyards were launching about one ton to every seven sent down the ways in England. In 1919, however, this country launched about two and a half tons to every one for England. In 1921, America lost this lead and has never since regained it, although the gap in production between the countries in 1932 was only 44,000 tons.

The output of steam and motor tankers almost doubled the 1935 figure, a gain, for all countries combined, of 329,000 tons being reported. Germany took the lead in this type vessel, with England close behind and the United States, third, but far back.

For motor vessels of all types last year's launchings showed a gain of almost 50 per cent over the 1935 figures, the increase in volume amounting to 389,000 tons. England led in construction, with Germany and Sweden following in the order named. America was far behind in last place.

Motor vessels represented about 57 per cent of all the merchant tonnage launched last year, compared with about 62 per cent in 1935. With the exception of 1929 and 1930, however, more motor tonnage was launched last year than ever before.

FINANCIAL NOTES

Scullin Steel Co., St. Louis, reports net profit for 1936 of \$116,175, or \$1.16 a share on the \$3.00 cumulative preferred stock. This compares with net loss of \$382,743 in 1935.

Youngstown Sheet & Tube Co. has declared an accumulated preferred dividend in arrears of \$9.62½ on its preferred shares payable Feb. 15. This dividend completes payment of all accumulated preferred dividends in arrears.

Westinghouse Electric & Mfg. Co., East Pittsburgh, and subsidiaries had consolidated net profit for 1936 of \$15,099,291 after all charges including Federal income and undistributed profits tax, equivalent to \$5.66 a share on the combined 79,974 shares of 7 per cent cumulative preferred stock and 2,586,341 shares of common stock. This compares with \$11,983,381 for 1935, equal to \$4.50 a share on the two issues. Orders booked during 1936 aggregated \$182,521,304, against \$123,629,333 in 1935, a gain of 47 per cent. Sales billed were \$154,469,031 in 1936, against \$122,588,555 for 1935, an increase of 26 per cent. Unfilled orders at Dec. 31 totaled \$48,490,919, highest since the end of 1929.

Indiana Steel Products Co., Chicago, (magnet manufacturer) had 1936 net income of \$135,116, or \$1.35 a common stock share, against \$116,428, or \$1.16 a common share, for 1935.

Buckeye Steel Castings Co., Columbus, Ohio (maker of railroad truck frames, yokes, couplers, etc.) had 1936 net income of \$882,220, equal to \$2.83 a common share, compared with 1935 net loss of \$167,134.

Apollo Steel Co., Apollo, Pa., had net income in 1936 of \$139,871, equivalent to \$1.10 a share, compared with net income in 1935 of \$134,875, or \$1.06 a share.

Fostoria Pressed Steel Corp., Fostoria, Ohio, had net loss in 1936 of \$25,995, against 1935 net loss of \$8465.

Consolidated Steel Corp., Ltd., Los Angeles (tank, tower and boiler manufacturer) had net profit in 1936 of \$425,649 after all charges, including undistributed earnings surtax, equal to slightly more than \$2.99 a share on 142,189 shares of \$1.75 no-par preferred stock outstanding. In 1935 net profit was \$121,541, or 81c. a preferred share, while the net in 1929 was \$673,122. Sales booked in 1936 aggregated \$6,569,202, against \$4,658,641 for 1935.

Crucible Steel Co. of America, New York, made a net profit of \$3,120,356 in 1936, equivalent, after preferred dividends, to \$2.49 a share on 550,000 shares of common stock, compared with \$1,268,176, or \$5.07 a share on 250,000 preferred shares, in 1935. Earnings were the largest since 1930, deficits having been incurred from 1931-33, inclusive. Operations averaged 74.32 per cent of capacity, against 61.63 per cent for 1935 and 23.42 per cent for 1932.

Allegheny Steel Co., Brackenridge, Pa., had a net income in 1936 of \$1,829,137 after depreciation, Federal income and undistributed profits tax and other charges, according to the company's preliminary

report. After 7 per cent preferred dividend requirements, earnings equaled \$2.12 a share on 750,254 common shares. For 1935 net income was \$1,151,454, or \$1.50 a share on 609,606 shares of common.

Sundstrand Tool Co., Rockford, Ill., reports 1936 net income of \$265,193, equal to \$2.32 a share. In 1935 net income amounted to \$79,149, or 93c. a share.

Acme Steel Co. reports for 1936 preliminary net profit of \$2,155,495, equal to \$6.57 a share. Profit for 1935 was \$1,760,965, or \$5.37 a share.

This Week on the Assembly Line

(CONCLUDED FROM PAGE 61)

units to 26,650. Chrysler has been aiming at 30,000 units a week, according to some schedules released to parts makers. The only production reported by General Motors was at its truck division in Pontiac, where 1400 units were assembled. Incidentally, the ratio of assembly of cars with the 85- and 60-hp. engines at Ford is now approximately 4 to 1. December sales showed a 3½ to 1 ratio between the big and small engine jobs.

Many Wage Increases Given

Although it appears on the surface that recognition was the chief issue in the General Motors strike, it is quite obvious that one of the dominant factors in the present labor movement is the boosting of wages. It was not surprising, therefore, to see Chrysler, General Motors and Packard come through with pay increases last week. Mr. Sloan let it be known that the General Motors pay increase of 5c. an hr., the second to be made in four months, had nothing to do with the present argument with the UAW, but he must have had his tongue in his cheek, since the whole drive of the UAW is to up wages in the industry. Chrysler announced a pay increase of 10 to 12 per cent, and amounting to an annual pay rise of \$13,000,000, just a day or so before its 1936 earnings statement was published, indicating net income of \$62,110,543, equal to \$14.25 a share on the common stock outstanding. This compares with earnings of \$34,975,818, or \$8.07 a share in the preceding year. Chrysler paid \$12 a share last year. The General Motors' pay increase will add \$25,000,000 to the annual payroll, and Packard's rise of 5c. an hr. will add \$2,000,000 to its present payroll of 12,500 persons. Not widely publicized have been the pay increases being made in other plants throughout the city, all in keeping

with the present trend. Goodyear, Goodrich and General Tire also announced last week pay increases amounting to 5c. to 8c. an hr.

On Monday Briggs and Murray Body plants and Ainsworth Mfg. Co. also announced wage increases, Briggs to be on a prorated merit basis. Murray's minimum rate will be 75c. an hr. for men, 65c. for women after six months' service. An agreement between attorneys of Kelvinator and MESA is being voted upon by workers this morning, court action being withheld.

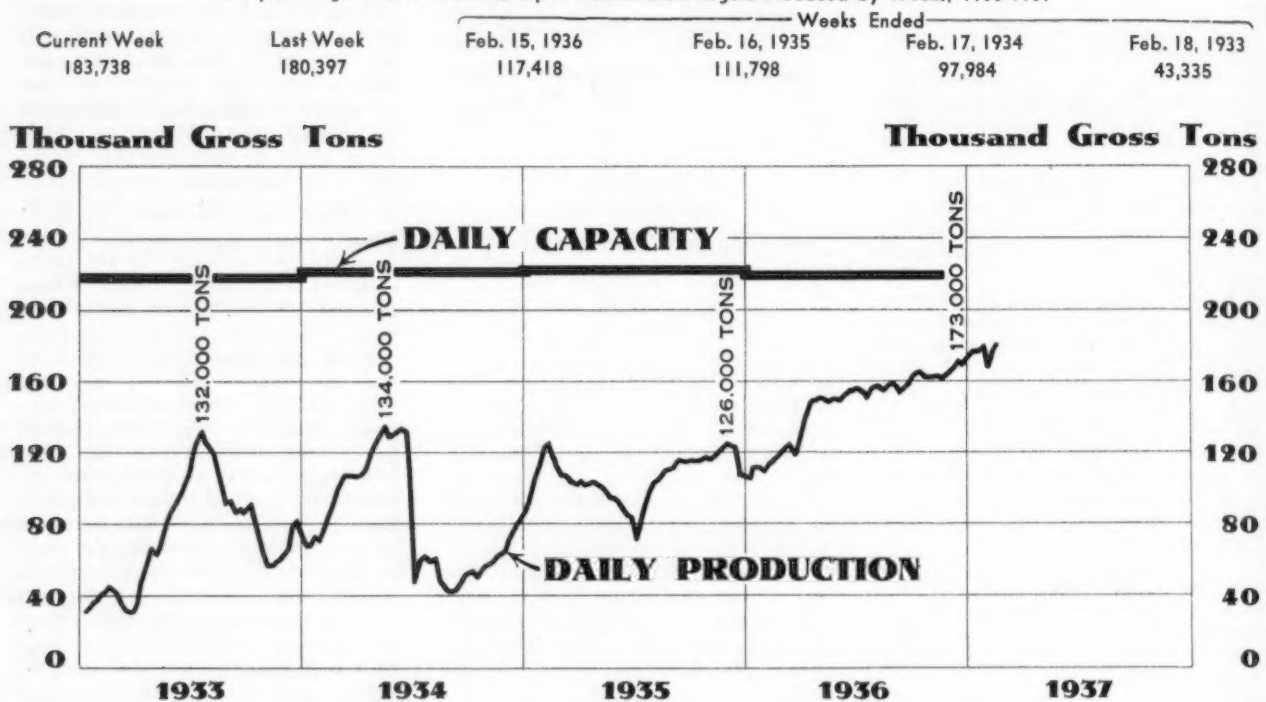
What wage increases and increased raw material prices will mean to the industry is yet to be seen. Mr. Knudsen, in a press conference last week, said that direct labor costs were but a small fraction of the retail selling price of the car. Sales officials indicated in December that every effort was being made to maintain present car prices, since it was felt that any increase would tend to restrict the market. Such being the case, it appears that net earnings of the motor car companies will be smaller in 1937 than in 1936, since wage increases throughout the country have, and are, affecting raw material prices and those of parts supplied on the outside. In this connection, it is interesting to note that price increases asked by parts companies on the basis of wage increases have been met in good spirit by all except one of the representative automobile companies.

Spies in Industry Probably on the Way Out

The investigation by Senator LaFollette's committee on the activities of investigating agencies in the automotive industry has not helped the general situation in recent weeks. As a result, it seems that this technique used by management to keep posted on the activities of organized labor is definitely on the way out. If, as has been testified, General Motors Corp. has paid the Pinkerton Agency \$500,000 since 1934, it did not get its money's worth, as recent events have proved. General Motors discontinued the services of this agency on Jan. 31, as it was evident that the names of the secret operatives were about to be exposed, and subsequently were. The testimony produced regarding the shadowing of Richard Frankenstein, UAW organizer in Detroit, by Corporation Auxiliaries Co. in Cleveland, embarrassed Chrysler no end, since Mr. Frankenstein has the situation well in hand, particularly at Dodge Main, and immediately issued a threat to the corporation to cease and desist "or else."

STEEL INGOT PRODUCTION

Daily Tonnage of Bessemer and Open-Hearth Steel Ingots Produced by Weeks, 1933-1937



Figures for the current week are not indicated on the chart until the following week.

STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

District	Current Week	Last Week	Jan. 16, 1937	Weeks Ended Feb. 15, 1936	Feb. 16, 1935
Pittsburgh	85.0	83.0	80.0	38.0	41.0
Chicago	80.5	80.0	77.0	60.0	65.0
Valleys	81.0	79.0	75.0	60.0	60.0
Philadelphia	58.0	56.5	56.5	40.0	36.0
Cleveland	80.0	78.0	76.0	64.0	67.0
Buffalo	86.0	84.0	78.5	28.0	46.0
Wheeling	98.0	98.0	94.0	76.0	90.0
Southern	74.5	74.5	74.5	62.0	50.0
Ohio River	46.0	19.0	97.0	79.0	75.0
Western	91.5	91.5	91.5	40.0	35.0
St. Louis	81.0	82.0	75.0	66.0	33.0
Detroit	93.0	93.0	100.0	100.0	100.0
Eastern	98.0	90.0	95.0	50.0	40.0
Aggregate	82.5	81.0	79.5	53.0	53.5
Average Year to Date	79.6	79.2	79.5	51.0	50.8

Weekly Booking of Construction Steel

FROM THE IRON AGE

	Feb. 16, 1937	Week Ended Feb. 9, 1937	Jan. 19, 1937	Feb. 18, 1936	Year to Date 1937	1936
Fabricated structural steel awards.....	39,430	25,630	12,950	33,215	205,095	150,765
Fabricated plate awards.....	1,960	7,575	2,175	1,945	25,550	55,805
Steel sheet piling awards.....	0	1,580	0	0	10,530	6,360
Reinforcing bar awards.....	6,980	4,385	2,500	3,100	25,615	72,295
Total Lettings of Construction Steel...	48,370	39,170	17,725	38,260	266,790	285,225



...SUMMARY OF THE WEEK...

... Steel demand shows further expansion and operating rates rise.

° ° °

... Lifting of General Motors suspensions not the only factor in new releases.

° ° °

... Scrap market turns stronger; export demand for steel and pig iron increases.

EXPANDING demand for steel is again adding to mill backlogs, as new business exceeds shipments, and has forced a further extension of deliveries on many products and higher operating rates. The ingot production is estimated at 82½ per cent of the country's capacity, 1½ points over last week.

Scrap markets, usually sensitive to developments, have turned sharply stronger. Advances of 50c. at Chicago and 25c. at Pittsburgh put THE IRON AGE composite for heavy melting steel up to \$19.25. Other grades have risen 50c. to \$1.50 a ton and point still higher.

Lifting of suspensions on General Motors orders, flood rehabilitation projects and replenishment of damaged stocks of jobbers and consumers, renewed buying on a large scale from the Pacific Coast following settlement of the maritime strike, the release of heavy specifications by railroads and car builders for repairs and new equipment, and an increase in export orders are the outstanding factors in the increased pressure on steel mills, but there are other influences, some psychological, such as the pending conference in the bituminous coal industry and continued agitation in steel labor circles.

In its steel releases General Motors is putting on most pressure for cold rolled sheets and strip for body plants, which were hit hardest in the strike. As these orders have been on the books since December, steel mills are giving General Motors business the right of way so far as is possible. Sheet deliveries are further extended, on some grades to 16 weeks, and orders are being taken for May and June shipment at prices then prevailing.

Railroads are using more steel than they have

in six or seven years. New freight cars placed since Dec. 1 call for 360,000 tons of steel, on which releases are now being received by the mills, and this figure does not take into account large quantities for repairs in roads' own shops. Rail shipments are being accelerated for spring track laying.

THE world famine in pig iron, scrap and steel is having unusual repercussions in this market. Upward of 100,000 tons of pig iron has recently been sold to Japan and large inquiries from England find some producers indifferent. Atlantic Coast merchant furnaces would gladly take the business if they could obtain sufficient ore and coke, but Lake Superior ore is unobtainable at this season and foreign ore prices are too high to permit an adequate profit. Japan, England and Italy, being short of pig iron, are large buyers of American scrap. Export demand for steel has increased because of the inability of European mills to offer early deliveries. On some products German mills quote nearly a year. Following the lifting a week ago of the Japanese import duties on iron and steel for two years, purchases of fully 75,000 tons of steel were made here. Tin plate predominated, but a fairly large tonnage of semi-finished steel also was taken.

ON top of these natural developments of a rising world-wide need for steel there is the fear of labor troubles overhanging the American industry. Immediate interest centers upon the outcome of negotiations in the bituminous coal industry, where any tie-up of production would undoubtedly cause an immediate shortage of coke and higher pig iron prices. This situation, in fact, makes it difficult for foreign countries to negotiate pig iron purchases here. An advance of \$1 a ton in Eastern pig iron prices is not improbable, whether interior furnaces take like action or not.

The steel mill labor situation has been further complicated by the demand of the Pittsburgh district council of employee representatives of the Carnegie-Illinois Steel Corp. for a \$5 a day minimum wage and an 80c. a day increase for all other workers and the proposal of the employee representatives' committee at the Aliquippa works of the Jones & Laughlin Steel Corp. for a flat increase of \$1 a day. Demands by the Steel Workers' Organizing Committee, the CIO group, which now claims 150,000 members, may be formulated sooner than expected.



...PITTSBURGH...

... Steel ingot output advances to 85 per cent, highest since 1929.

o o o

... Orders pour in from many directions, adding to mill backlogs.

o o o

... Scrap market stronger with advance of 25c. in heavy melting steel.

PITTSBURGH, Feb. 16.—Reaching the highest level since the fall of 1929, steel ingot operations in the Pittsburgh district have advanced two points to 85 per cent of capacity. While this figure is based on theoretical capacity, it is probably true that all producers in this district are operating at as high a level as is practicable. Operations in the Wheeling district remain unchanged at 98 per cent of capacity.

Although the lifting of automobile suspensions will add somewhat to mill backlogs in this district, the added factors of the maritime strike settlement and demand coming from flood rehabilitation projects in the Ohio Valley, are being reflected in a good volume of orders received in the past few weeks.

Heavy plate and structural backlogs have been added to rather than reduced, and with the certainty of a good spring building program, it is expected that the heavy materials will furnish considerable support to this district's operations for some time.

Within the next few weeks cold finished bar unfilled tonnage will be augmented by releases from General Motors plants. Hot rolled bar specifications are in fair volume and deliveries are still running to at least four weeks. No change has been noted in the steady specifying of tubular goods and, if anything, an increase has materialized. Some part of this improvement is due to West Coast specifications.

An unusually heavy demand is growing for semi-finished steel, and there is no doubt that the aggregate inquiries are greater than

available supplies. Despite the tremendous tonnages ordered last December, non-integrated makers have used up most of these supplies and are clamoring for more.

Sheet business continues to roll in and many of the incoming specifications are being scheduled for second quarter delivery on the basis of prices in effect at that time. Shipping promises on some sizes run to 16 weeks.

Tin plate specifications are unusually heavy for this time of year and operations continue at 97 per cent. Most producers have good-sized backlogs and have been able to reduce stocks at their plants.

The raw material markets are exceptionally strong, and there is a growing conviction that pig iron supplies are far from plentiful. Reflecting a strong scrap market, No. 1 heavy melting has advanced 25c. a ton.

Pig Iron

Producers are shipping all the iron they can make. In the past week some customers have shown a disposition to enter larger orders. This trend is attributable to the growing conviction that pig iron supplies are far from plentiful. Neither steel mills nor merchant producers have been able to lay in much stock. Few, if any, blast furnaces can be brought in without a tremendous outlay of money. Furthermore, some regular iron customers are requiring tonnages above those taken last year. Part of the increased demand has been because of rising scrap prices, but the major cause has been a bona fide increase in consumption.

Semi-Finished Steel

Demand has been rising sharply since the first of the month, and a continuation of the trend is expected. Many non-integrated mills have whittled down large tonnages ordered last December before prices went up. The unprecedented demand for sheets has cut into sheet bar stocks, while an excellent pipe business has resulted in heavy ordering of piercing blooms. There is no doubt that aggregate demand is greater than available supplies, with little chance of the situation being relieved until additional primary steel-making facilities materialize.

Bolts, Nuts and Rivets

While total new business is slightly behind that of last week, fair-sized specifications have come from automobile makers, in addition to the lifting of General Motors suspensions. Meanwhile, production is at practical capacity. Miscellaneous specifications are steady, and as soon as car builders get final details worked out on recent awards an avalanche of orders from that source is expected.

Bars

Incoming specifications are holding up well and backlogs at some plants will be added to, owing to the lifting of General Motors suspensions. While only a small proportion of the total hot bar business in this district finds its way to the automobile industry, alloy bar specifications will be greatly benefited by the settlement of labor difficulties. The general character of new business is miscellaneous. Fill-in orders continue to be received from farm implement makers, whose operations have been maintained at a breakneck pace for months. The resumption of normal demand on the part of West Coast customers and new orders appearing directly or indirectly as a result of flood rehabilitation give promise of a comfortable flow of business for some time.

Cold-Finished Bars

Resumption of production at General Motors plants will be felt by cold-finished bar producers within the next few weeks. Lifting of suspensions to date has not been of any great consequence, but as soon as initial manufacturing difficulties have been ironed out much heavier releases are expected. Meanwhile, miscellaneous business is holding up well and the next month or two will see not only heavier automobile business but a reentry into the market of jobbers.

Reinforcing Bars

Bethlehem Steel Co. will furnish 616 tons of reinforcing bars for

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous:
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Feb. 16, 1937	Feb. 9, 1937	Jan. 19, 1937	Feb. 18, 1936
Rails, heavy at mill.....	\$39.00	\$39.00	\$39.00	\$36.37 1/2
Light rails, Pittsburgh.....	38.00	38.00	38.00	35.00
Rerolling billets, Pittsburgh.	34.00	34.00	34.00	29.00
Sheet bars, Pittsburgh.....	34.00	34.00	34.00	30.00
Slabs, Pittsburgh.....	34.00	34.00	34.00	29.00
Forging billets, Pittsburgh..	40.00	40.00	40.00	35.00
Wire rods, Nos. 4 and 5, P'gh	43.00	43.00	43.00	40.00
Skelp, grvd. steel, P'gh, lb...	1.80	1.80	1.80	1.80

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	2.20	2.20	2.20	1.85
Bars, Chicago.....	2.25	2.25	2.25	1.90
Bars, Cleveland.....	2.25	2.25	2.25	1.90
Bars, New York.....	2.55	2.55	2.55	2.20
Plates, Pittsburgh.....	2.05	2.05	2.05	1.80
Plates, Chicago.....	2.10	2.10	2.10	1.85
Plates, New York.....	2.33	2.33	2.33	2.09
Structural shapes, Pittsburgh	2.05	2.05	2.05	1.80
Structural shapes, Chicago..	2.10	2.10	2.10	1.85
Structural shapes, New York	2.305	2.305	2.305	2.06 1/4
Cold-finished bars, Pittsburgh	2.55	2.55	2.55	2.10
Hot-rolled strips, Pittsburgh.	2.15	2.15	2.15	1.85
Cold-rolled strips, Pittsburgh	2.85	2.85	2.85	2.60
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.80	2.80	2.80	2.40
Hot-rolled annealed sheets, No. 24, Gary.....	2.90	2.90	2.90	2.50
Sheets, galv., No. 24, P'gh..	3.40	3.40	3.40	3.10
Sheets, galv., No. 24, Gary..	3.50	3.50	3.50	3.20
Hot-rolled sheets, No. 10, Pittsburgh.....	2.15	2.15	2.15	1.85
Hot-rolled sheets, No. 10, Gary.....	2.25	2.25	2.25	1.95
Cold-rolled sheets, No. 20, Pittsburgh.....	3.25	3.25	3.25	2.95
Cold-rolled sheets, No. 20, Gary.....	3.35	3.35	3.35	3.05
Wire nails, Pittsburgh.....	2.25	2.25	2.25	2.10
Wire nails, Chicago dist. mill	2.30	2.30	2.30	2.15
Plain wire, Pittsburgh.....	2.60	2.60	2.60	2.30
Plain wire, Chicago dist. mill	2.65	2.65	2.65	2.35
Barbed wire, galv., P'gh.....	2.75	2.75	2.75	2.50
Barbed wire, galv., Chicago dist. mill.....	2.80	2.80	2.80	2.55
Tin plate, 100-lb. box, P'gh*	\$4.85	\$4.85	\$4.85	\$5.25

* Practically the equivalent of previous quotations owing to new method of quoting, effective Jan. 1, 1937.

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Pig Iron

Per Gross Ton:	Feb. 16, 1937	Feb. 9, 1937	Jan. 19, 1937	Feb. 18, 1936
No. 2 fdy., Philadelphia....	\$22.76	\$22.76	\$22.76	\$21.3132
No. 2, Valley furnace.....	21.00	21.00	21.00	19.50
No. 2, Southern Clin'ti.....	20.69	20.69	20.69	20.2007
No. 2, Birmingham†.....	17.38	17.38	17.38	15.50
No. 2, foundry, Chicago*....	21.00	21.00	21.00	19.50
Basic, del'd eastern Pa.....	22.26	22.26	22.26	20.8132
Basic, Valley furnace.....	20.50	20.50	20.50	19.00
Malleable, Chicago*.....	21.00	21.00	21.00	19.50
Malleable, Valley.....	21.00	21.00	21.00	19.50
L. S. charcoal, Chicago.....	26.54	26.54	26.54	25.2528
Ferromanganese, seab'd, car- lots.....	80.00	80.00	80.00	75.00

† This quotation is subject to a deduction of 38c. a ton for phosphorus content of 70 per cent or higher.
* The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh..	\$19.75	\$19.50	\$19.75	\$14.75
Heavy melting steel, Phila...	18.50	18.50	17.50	13.75
Heavy melting steel, Ch'go..	19.50	19.00	18.00	14.50
Carwheels, Chicago.....	18.75	18.50	18.50	14.00
Carwheels, Philadelphia....	18.50	18.50	18.50	14.75
No. 1 cast, Pittsburgh.....	17.75	17.75	17.25	14.25
No. 1 cast, Philadelphia.....	19.25	19.25	18.75	13.00
No. 1 cast, Ch'go (net ton)..	16.00	16.00	16.00	13.00
No. 1 RR. wrot., Phila.....	17.25	17.25	16.75	13.25
No. 1 RR. wrot., Ch'go (net)	16.75	16.75	16.75	13.25

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt.....	\$4.00	\$4.00	\$4.00	\$3.65
Foundry coke, prompt.....	4.50	4.50	4.50	4.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn....	14.00	13.00	13.00	9.25
Lake copper, New York.....	14.12 1/2	13.12 1/2	13.12 1/2	9.37 1/2
Tin (Straits), New York....	51.50	50.25	51.00	47.75
Zinc, East St. Louis.....	6.40	6.40	6.00	4.85
Zinc, New York.....	6.75	6.75	6.35	5.22 1/2
Lead, St. Louis.....	5.85	5.85	5.85	4.35
Lead, New York.....	6.00	6.00	6.00	4.50
Antimony (Asiatic), N. Y....	14.25	14.25	14.25	12.87 1/2

The Iron Age Composite Prices

Finished Steel

Feb. 16, 1937	2.330c. a Lb.
One week ago	2.330c.
One month ago	2.330c.
One year ago	2.109c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output.

	HIGH	LOW
1937.....	2.330c., Dec. 28;	2.084c., Mar. 10
1936.....	2.130c., Oct. 1;	2.124c., Jan. 8
1935.....	2.199c., April 24;	2.008c., Jan. 2
1934.....	2.015c., Oct. 3;	1.867c., April 18
1933.....	1.977c., Oct. 4;	1.926c., Feb. 2
1932.....	2.037c., Jan. 13;	1.945c., Dec. 29
1931.....	2.273c., Jan. 7;	2.018c., Dec. 9
1930.....	2.317c., April 2;	2.273c., Oct. 29
1929.....	2.286c., Dec. 11;	2.217c., July 17
1928.....	2.402c., Jan. 4;	2.212c., Nov. 1
1927.....		

Pig Iron

\$20.25 a Gross Ton
20.25
20.25
18.84

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

	HIGH	LOW
1937.....	\$19.73, Nov. 24;	\$18.73, Aug. 11
1936.....	18.84, Nov. 5;	17.83, May 14
1935.....	17.90, May 1;	16.90, Jan. 27
1934.....	16.90, Dec. 5;	13.56, Jan. 3
1933.....	14.81, Jan. 5;	13.56, Dec. 6
1932.....	15.90, Jan. 6;	14.79, Dec. 15
1931.....	18.21, Jan. 7;	15.90, Dec. 16
1930.....	18.71, May 14;	18.21, Dec. 17
1929.....	18.59, Nov. 27;	17.04, July 24
1928.....	19.71, Jan. 4;	17.54, Nov. 1

Steel Scrap

\$19.25 a Gross Ton
19.00
18.42
14.33

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW
1937.....	\$19.25, Feb. 16;	\$17.92, Jan. 4
1936.....	17.75, Dec. 21;	12.67, June 9
1935.....	13.42, Dec. 10;	10.33, April 23
1934.....	13.00, Mar. 13;	9.50, Sept. 25
1933.....	12.25, Aug. 8;	6.75, Jan. 3
1932.....	8.50, Jan. 12;	6.43, July 5
1931.....	11.33, Jan. 6;	8.50, Dec. 29
1930.....	15.00, Feb. 18;	11.25, Dec. 9
1929.....	17.58, Jan. 29;	14.08, Dec. 3
1928.....	16.50, Dec. 31;	13.08, July 2
1927.....	15.25, Jan. 11;	13.08, Nov. 22

the Monte Bello tunnel project at Baltimore. Large awards in the past week have been light, but a fair number of projects involving less than 100 tons have been let. Taylor-Davis Co., Philadelphia, will supply a tonnage of concrete bars for the construction of a factory building for the Delaware Hard Fiber Co., Wilmington, Del. The past week has been quiet, but deliveries are becoming increasingly difficult owing to heavy backlogs at hot-rolled bar mills. The Detroit pumping station and grit chambers project, which will require 2200 tons of concrete bars, has been held up pending settlement of property title difficulties.

Steel Sheet Piling

The market has been rather quiet in the past week, with no outstanding awards having been made. What activity there has been involves small jobs requiring less than 50 or 75 tons.

Plates and Sheets

One of the main supports of this district's operating rate is coming from exceptionally heavy backlogs of plates and shapes and in the past week these were added to rather than reduced. Despite the large number of projects that have come out since the first of the year, it is understood that many more are being whipped into the final stage and will probably make their appearance this spring. Heavy manufacturing schedules are bringing to light the need for additional space, hence new buildings. American Bridge Co. will fabricate 1350 tons of shapes for a factory building for Pfau & Co., Rochester, N. Y. Jones & Laughlin Steel Corp. will furnish 1500 tons of material for the construction of a paper plant at San Bernardino, Fla., for the Container Corp.

Railroad Business

Both inquiries and awards have been light in the past week. Detroit, Toledo & Ironton Railroad is inquiring for 800 50-ton box cars. The New York Board of Transportation will take bids March 5, for 50 subway cars. Between 2000 and 2500 freight cars are yet to be placed by the Northern Pacific and awards are expected soon on 100 70-ton gondolas for the Grand Trunk Western.

Tin Plate

Bookings are unusually high for this time of the year and showed a slight increase in the past week. Operations continue around 97 per cent and most producers have a comfortable backlog. Much of the material being ordered at this time is for prompt shipment, and some

reduction in stocks at producers' plants since the first of the year has occurred. A good portion of the business placed in the past week has been for export to Japan.

Sheets

The steady stream of sheet specifications continues unabated, and there is no let-up in sight. Promises on some sizes are as far advanced as 16 weeks. Pressure for delivery is terrific and "shopping around" by consumers is of little avail, as most sheet producers are in the same position. Tonnages for railroad car builders are piling up and miscellaneous demand is in excellent volume. The lifting of General Motors suspensions comes at a time when producers are already finding it extremely difficult to anywhere near comply with customers' wishes regarding deliveries. Orders resulting from rehabilitation in areas which were flooded are being received, and it is expected that they will grow as the real extent of damage is determined.

Strip

Orders show no change from a week ago and for the most part are emanating from miscellaneous sources. Most strip producers in this district were little affected by the General Motors shutdown, as many parts makers continued to take the steel in order to build up their banks. However, releases from this source will be large enough to add to present backlogs, which are running about four to five weeks.

Tubular Products

Some talk is going the rounds that pipe increases, if they materialize, will probably involve only the smaller sizes. No definite announcements have been made as yet, but if any action is taken the information will be forthcoming within the near future. Meanwhile, specifications for tubular goods are being maintained at a high level. Oil-country goods has shown no drop-off and, although jobbers have fairly good supplies of standard pipe, it is moving into consumption rather briskly. As a result of this, specifications from jobbers to mills are in excellent volume. Heavy consignments of pipe are moving to the West Coast, and it is expected that demand from this source will resume its normal trend.

Wire Products

Producers are focusing most of their attention on production and delivery problems. Considerable pressure is being brought to bear in some quarters. The resumption of General Motors plants will in-

crease unfilled tonnage slightly. Ultimate consumption of wire items is being maintained at a good rate. Nothing definite regarding second quarter prices has been announced, but some news may be forthcoming before March 1.

Coal and Coke

Users of industrial coal are greatly increasing their stocks in anticipation of labor disturbances and as a consequence coal production has been stepped up sharply. The same is true to a lesser extent in the beehive coke regions. The high rate of coke consumption and the lack of productive facilities, however, prevents consumers from building up coke stocks to any great extent. Considerable attention will be paid to the negotiations which take place this week at New York between United Mine Workers' officials and coal operators. The attempt by John L. Lewis to unionize the steel industry injects a factor into the coal negotiations this year which was not present in former years. It has been thought by some that Lewis might try to use the "captive" mines as a means toward furthering his drive on the steel industry.

Steel for "Bikes" in 1936 Set New High

REVIVAL of the sport of bicycling during 1936 brought orders for 15,000 tons of steel to the mills of the country, according to estimates of the American Iron and Steel Institute. This is by far the largest amount of steel ever bought in one year by bicycle makers.

More than 1,200,000 "bikes" were manufactured during the year, which is close to, if not actually, an all-time record. The total is twice the 1935 output and nearly four times the average number made yearly between 1928 and 1934.

In 1899, the previous record bicycle year, 1,182,700 "bikes" were built to meet the peak demand of the "Gay Nineties" period, but the weight of steel consumed in that year was far less than the 1936 total because the streamlined and sturdier bicycle demanded today uses much more steel than the earlier and simpler styles.

About 12½ lb. of steel was enough for one "bike" 50 years ago, but about 25 lb., mostly tubing and strip steel, goes into the rugged frames and streamlined mudguards, headlamps and horns of the up-to-date bicycle.



CHICAGO

... **Steel specifications gain as General Motors and railroads press for shipments.**

... **Shortage of raw steel forces ingot operating rate to 80½ per cent.**

... **Scrap market points higher; pig iron shipments gain over January.**

CHICAGO, Feb. 16.—Specifications for finished steel are again on the upward march as General Motors and the railroads press for more steel. The automobile picture is particularly fine, and car shops and railroad shops are using more steel than in six or seven years. Many railroads are now looking forward to heavier shipments of rails for spring track work. The farm implement group is taking all the steel it can get and thereby is adding its bit to the troubles of mills which are suffering from the pangs of shortages of raw steel.

Ingot output has moved up one-half point to 80½ per cent of capacity with some mills operating open-hearth departments well above their practical rating.

The impression will not be downed in this area that many users are carrying not only large stocks of steel but that they also have made many parts ahead of actual requirements. How troublesome these overstocks will prove to be must be determined by the course of business over the next three to four months.

The scrap market in rising to new high prices has lost none of its zip. In fact, most signs point to a further rise, which may not be checked unless large accumulations at northern Lake ports act as a flood with the opening of navigation, which is about three months away. Certain it is that the prices now in effect are not loosening supplies.

Pig Iron

Advancing scrap prices are playing into the hands of pig iron

producers, who report shipments in the first half of February to exceed those of the like period in January by 30 per cent. There is no direct move now to advance prices, but sellers are keeping a close eye on labor, and quotations on coal and ore. There is complaint from foundries of a shortage of floor molders, and some units, so handicapped, are operating at practical capacity and are turning away business.

Warehouse Business

February business is brisk and the trade is getting set for March, which is usually one of the high months of the year. Stocks of most warehouse lines are well balanced, the outstanding exception being sheets.

Structural Material

Releases to mills are growing and the delivery situation, as on other finished steel products, is causing much concern to users. The New Boston, Ill., dam requiring 3,300 tons has been placed. Most Western States are now well represented in the bridge market, and new inquiries of this nature are taking shape. Railroad business is in the market, but it is all small and covers relatively minor repairs to existing bridge structures.

Reinforcing Bars

Inquiries and awards are limited in size and number but architects are busy and the outlook is good. There is a moderately better tone to prices, but they still have far to go before real stabilization can be attained. The Sanitary District, Chicago, has placed a small tonnage, but new plans are on the

boards and several large tonnages will be out for figures before spring. Chicago is placing a string of 20 or more schools, each of which requires less than 100 tons. Illinois highway work is more active, but construction as now undertaken makes use of only 1½ tons of bars per mile. Mill deliveries range from four to six weeks, but they may be delayed further now that more steel will flow to General Motors plants.

Plates

Mills are now in an exceedingly comfortable position as a result of car business and the general activity in railroad shops, some of which are building new cars and all of them are engaged on heavy repairs of cars and locomotives. The Canadian Pacific has ordered both cars and locomotives. The Pere Marquette has placed 11 locomotive tenders and the Chicago & Illinois Midland has ordered 200 cars. The Grand Trunk Western is inquiring for 450 cars and the Detroit, Toledo & Ironton will buy 800 cars. Local steel people feel that the big bulge in car buying is past for the time being, but they point out that recent purchases do not by a long measure cover the actual requirements of the railroads. Miscellaneous tank business has enjoyed the most active week in several years.

Bars

Releases by General Motors are large and urgent, and mills report a rapid rise in specifications, which are also strongly influenced by the exceptional activity of farm equipment manufacturers. Deliveries now average 30 days, but it is doubtful if promises for this period can be maintained in the face of conditions as they are now developing. Miscellaneous demand is excellent. There is no hint of lower consumption except from certain automobile parts makers, who feel that they are facing the threat of labor troubles.

Wire Products

Rising world market prices, especially in South America, are being watched from the sidelines because most American producers find the domestic trade is taking about all they can produce. It is now reported that a large part of the flood damaged stocks cannot be reclaimed and therefore must be replaced promptly. In the South and in the near-South demand from dealers and jobbers is getting away to an unusually early start, and some distributors are already drawing on mills for replenishment of stocks. Resumption of peak automobile production is placing

added stress on wire mill production and shipping facilities.

Rails

Railroads are now asking for rails faster than mills can conform to their desires. This is not unwillingness to cooperate on the part of the mills, but they are up against a strict apportionment of raw steel. It is highly probable that plans will be worked out so that rail production will be stepped up before the end of this month. Accessory production is unchanged, but releases are coming in faster and here again demand is placing added stress on mills.

Sheets

General Motors is back in the market, which is tight in so far as first quarter deliveries are concerned. Some mills have nothing to offer for the remainder of the first quarter except limited tonnages of electrical sheets and some cold-rolled strip. All coated products, except tin plate, are being taken for May, as the earliest possible delivery and at such prices as shall prevail in that month.



...No let-up in pressure on Alabama mills.

o o o

...Jobber stocks moving and need replenishment.

BIRMINGHAM, Feb. 16.—Local mills and furnaces are still so well loaded with old business that new tonnage has not yet become a matter of paramount concern. The pressure on mills for shipments continues without abatement, as reflected by steady blast furnace and open-hearth operations. During most of the first quarter production and shipments will constitute the chief problems of the mills.

In spite of the heavy commitments of the last quarter, the various markets are beginning to show signs of additional needs and buying is spreading a bit. Reports come in from the field that jobber stocks are moving steadily and that it will be necessary for them to return to the market before long.

Seventeen open hearths and 15

blast furnaces were in production last week. The same schedule will be followed this week.

Tennessee Coal, Iron & Railroad Co. has lately increased red ore production, reopening No. 4 mine at Muscoda and No. 10 mine at Wennonah.



...Production congestion looms at sheet mills.

o o o

...Flooded steel plants expected to resume soon.

CINCINNATI, Feb. 16.—Ending of the automobile strike added to production problems of district steel producers. When automotive specifications eased, producers rearranged rolling schedules to take care of other demand, but, with car builders back in the market, production congestion looms. The leading district interest is out of the market on certain items for this quarter, but second-quarter business, to obtain good position on rollings, is being accepted at the then prevailing prices.

All units of the American Rolling Mill Co. are in full operation. The Middletown strip mill, which was down for repairs, is back in operation. The Newport Rolling Mill Co. plants are still being reconditioned after the flood, but early return to production is expected. Word of renewed operation at the Portsmouth units of Wheeling Steel Corp. is expected daily. The furnaces of Wheeling Steel Corp. at Portsmouth and of Andrews Steel Mill are not yet in operation, but probably will resume shortly.

Steel ingot production is about 40 per cent with 12 out of 33 open hearths in operation.

A step-up in pig iron shipments the past week reflected the renewal of activity in a large number of local foundries which were idle because of flooding. New pig iron business is not active, most melters buying only for urgent needs. The melt is increasing daily, production averaging about 55 to 60 per cent of capacity.

With the Portsmouth ovens of Wheeling Steel Corp. reheated, coke supply is now normal. Supply

during the flood period was maintained by shipments from other areas. New business is not great, but shipments are moving upward at a steady pace as the melt improves.



...Iron and steel trade continues upward trend.

o o o

...Recent railroad buying stimulates production.

TORONTO, Feb. 16.—Awarding of contracts for rolling stock by the Canadian railroads to the value of \$26,500,000 has brought a stepping up of plant operations by iron and steel companies and also has been responsible for increased buying of raw materials. Demand for iron and steel for domestic use is at the highest level since 1929, with indications that business for the current year may reach an all-time high, while at the same time there is a growing demand for Canadian steel materials in the export markets, particularly Europe and British dominions. The mining industry is responsible for a large turnover in steel and general machinery, while the automotive industry also is placing orders on a larger scale than formerly. The agricultural implement industry is in the market for various lines of materials and is steadily increasing production, while at the same time there has been improvement in building trades, particularly bridge construction, which has resulted in placement of upward of 15,000 tons of steel within the past two weeks.

Steel Co. of Canada, Ltd., Hamilton, is enlarging its blooming mill and adding a new open hearth.

In the merchant pig iron markets demand is picking up steadily. Shortage of iron scrap also is responsible for increased consumption of foundry iron and has been reflected in heavier purchases by a number of the larger users. Producers report no change in iron prices in the Toronto and Montreal areas with base grade, 2.25 silicon and under in the former area, \$21.50 and malleable, \$22, while Montreal prices are base grade, \$23 and malleable, \$23.50. For points outside Toronto and Montreal additional freight rates must be added.



... PHILADELPHIA ...

... Operations increase $1\frac{1}{2}$ points to 58 per cent of capacity.

o o o

... Some offices report new business increasing over that received the first two weeks this month.

o o o

... Deliveries constitute greatest problem of sellers.

PHILADELPHIA, Feb. 16.—Pressure for deliveries and a continuous influx of new business have forced operations to an average of 58 per cent of capacity, up $1\frac{1}{2}$ points from last week.

All sales offices report current bookings on a par with the first two weeks of the month, although some have experienced increases this week. At least two district mills are engaged in shipping steel to Pacific Coast consumers and, in one case, the resumption of this trade is mainly responsible for the starting up of an additional open-hearth unit. The cessation of General Motors' buying during the strike had no serious effect in this district, and, likewise, the release of this business following the settlement of the dispute has made no difference in production here. It is believed, however, that when this buying is once more fully underway, shipping difficulties in the Central West may become so involved as to affect deliveries to customers in this area, which are already so far extended that salesmen of some products are proclaiming conditions as the worst within memory. With practically all purchasing being for urgent, immediate needs, the possibility that an extended steel strike may precipitate a rush of orders for the filling of stocks is sufficient to cause apprehension, as shippers would thus be thrown into far greater confusion than is the case at present.

The Edward G. Budd Mfg. Co. and the Heintz Mfg. Co., both of which were affected to some extent by the hold-up of Chevrolet business because of the strike, are in nearly full production for this company once more. The latter organization reports that its business actually increased during the strike, as the demand for Chevrolet service parts, many of which it

supplies, such as fenders, running boards, radiator shells and grilles, oil cans, gas tank covers, etc., was bolstered by the fact that these parts were not easily obtainable at the company's plants. In addition, the Heintz Co. is occupied on work for International Harvester, Overland and the Navy, providing for the last named, stacks, hatches and bulkhead doors of stainless steel for cruisers, torpedo boats and other Government craft now under construction. The Budd company's full complement of truck frames is being turned out again, while passenger frame production is not yet quite up to the level established prior to the strike, although it is expected to equal and surpass that mark soon. Other work at this plant includes the making of bodies and body parts for Ford, Studebaker, Chrysler, Dodge, Packard, Plymouth and International Truck, and stainless steel trains for the Santa Fe and the Rock Island.

McCloskey & Co. were awarded a \$47,000,000 contract on a cost-plus basis for most of the work on the Pennsylvania Railroad's \$58,000,000 Paoli-Harrisburg electrification program.

The sit-down strike of 1800 men in the Electric Storage Battery Co.'s plants was terminated last Saturday as a result of terms reached by representatives of the Battery Workers' Federal Union and Mayor Wilson's Labor Advisory Board. Pending negotiations for a 15c. increase in hourly wage rates, the workers agreed to evacuate the plants and go back to work this week on a full production basis. It is understood that, should no agreement be reached, the men may renew their sit-down strike.

Fear that coal miners and operators may be unable to come to

terms for the renewal of the agreement which expires April 1, and that a strike may result, is causing buyers to build up coal stocks which amount to as much as a month's supply in some instances.

Pig Iron

There is still little spot buying, although shipments continue fairly heavy, as stocks are low. An otherwise dull market is being enlivened by foreign inquiry, of which it is understood several hundred thousand tons exists, with England, Japan and Norway important factors. Over 100,000 tons has already been sold to Japan, and that country is said to be willing to buy almost any quantity. Of this Japanese figure, about 65,000 tons came from a producer here, while the remainder is believed to have been sold from the New England district. Plans are still underway for the starting up of the Riddlesburg furnace, with only a few financial details and arrangements for ore yet to be completed before production can commence. The ore situation is the main hindrance to any independent furnace operator who may wish to take advantage of the tremendous demand created both within domestic limits and from abroad. With Lake ore shipments at a standstill, Spanish ores bottled up by the civil war there, and rising ocean freight rates, it has become exceedingly difficult and well-nigh impossible to pay the going price for ore and convert it into iron at a profit. For this reason, mainly, sellers and producers are predicting a \$1 per ton increase in price about the first of March, with possibly another advance shortly thereafter. If prices are more equitably adjusted in relation to present costs, it is reliably known that the Chester unit will begin making iron once more. Only about six weeks' work will be necessary to prepare this furnace for blast.

Plates and Sheets

Railroad and oil company demand is maintaining plate business at recent levels, one mill reporting additions to its backlog this week. Plates are obtainable in from 10 days to six weeks. The Norfolk & Western Railroad placed 1000 tons of plates with a Philadelphia sales office last week. Shipments are still underway to California consumers, and there seems to be some export demand. Sheets continue in great demand, with one office quoting 17 to 18 weeks for delivery on nearly all grades. District mills can deliver in from four to six weeks, however, and expect to benefit by this comparatively easy situation when the full load of automotive buying is once

more placed in western mills. Thus far, no effects of the renewal of this purchasing have been noticed here, as recent extensions to deliveries have been due to other factors.

Shapes and Reinforcing Bars

Awards this week are light. Bethlehem obtained 150 tons for a du Pont addition at Wilmington, American Bridge and Phoenix Bridge secured 190 tons each for a Pennsylvania Railroad bridge alteration over the Chesapeake & Delaware canal, and Frank M. Weaver was awarded the contract for 170 tons of shapes for a Glassboro, N. J., Owens-Illinois Glass Co. structure. No new projects of any size have been reported. No awards have yet been made for the reinforcing steel needed for the Philadelphia schools mentioned last week. A fair amount of bars will be required for the Pennsylvania's electrification program, but the exact tonnage is not yet known.

Imports

The following iron and steel imports were received here during the past week: 1309 tons of pig iron from Soviet Russia; 2750 tons of chrome ore from the Philippine Islands; 25 tons of manganese ore from the Dutch East Indies, and 100 tons of sponge iron from Sweden.



....ST. LOUIS....

... Pig iron shipments at a heavy rate.

o o o

... Structural steel demand is light.

ST. LOUIS, Feb. 16.—Shipments of pig iron continue at a heavy rate, and it is expected that February will show an increase of from 15 to 20 per cent more than January, although it is a shorter month. This is due to the desire of melters to take in all of the material purchased before prices advance. In the meantime, there is very little buying, and none is expected until books open on March 1 for second-quarter shipments. It is not believed there will be any heavy buying movement then, as many melters have bought sufficient pig iron to supply them well into the second quarter, it is stated.

Delay in receipt of sheets and

coke is said to have slowed down operations in the stove foundries in the Belleville district.

Demand for structural shapes continues light. Highway bridge projects are being held up pending allotments from Washington, and no private plans of size are being considered.



...BOSTON...

... Heavy export demand for pig iron.

o o o

... Japan and England seek large tonnages.

BOSTON, Feb. 16.—With export buying increasing, a possibility of a pig iron shortage before June 30 looms. On the current buying movement more than 100,000 tons of pig iron has been sold to Japan and European countries. Japan is in the market for an additional 25,000 tons, and England 100,000. Current export prices are above those being paid by foundries. Deliveries run through June.

Foundries are using iron faster than anticipated and will be in the market for fresh supplies next month. Indications strongly point to higher prices on domestic deliveries when books are opened for the next quarter. Not in years has the market been as tight as it is today. New England foundries the past week bought an aggregate of 2000 tons.



...SAN FRANCISCO...

... About 35,000 tons of steel awarded for buildings.

o o o

... Chaotic shipping conditions hold back some business.

SAN FRANCISCO, Feb. 15.—The Consolidated Steel Corp. has been awarded 20,000 tons of structural steel and 4800 tons of reinforcing bars to be involved in

the construction of a Federal building in Los Angeles. General contract for the \$6,500,000 combined post office and jail was taken by George A. Fuller Co., Washington. The 16-story structure will be built in conjunction with the Union Terminal Railroad Station. The station itself calls for 8000 to 10,000 tons of structural steel, which is also reported to have been taken by Consolidated. These projects, started nearly a year ago, were two of the largest jobs announced on the Pacific Coast during 1936.

Other important awards during the week were entirely lacking, and only two definite new projects of size were announced. Bids will be opened Feb. 24 on 500 tons of reinforcing bars called for in the building of a State hospital. Bids have been opened by Utah Copper Co., Salt Lake City, Utah, for the construction of a 7000-ft. vehicular tunnel between Bingham and Copperfield; estimated cost \$1,000,000.

Shipping conditions on the Pacific Coast are still chaotic, with the result that the steel demand is slight as yet. Many small jobs have been announced, but the larger projects are being held until there is assurance of immediate delivery of materials.



....BUFFALO....

... Steel plant operations are steady.

BUFFALO, Feb. 16.—Twenty-six open-hearths are being operated at Bethlehem's Lackawanna plant, with seven active at Republic Steel and two at Wickwire-Spencer.

Tompkins and Delaware counties contributed highway bridge jobs in the amounts of 174 and 190 tons respectively. Both contracts for steel have been let, one coming to a Buffalo maker.

A sewage disposal plant in Salamanca will require 100 tons of reinforcing bars. A Syracuse general contractor is low bidder. At Silver Creek, N. Y., bids will be taken Feb. 25 on a grade crossing job to require 150 tons of bars. An Ovid, N. Y., central school to be bid on Feb. 19 will require 250 tons of structural and 100 tons of bars.

Producers report steady specifications against pig iron contracts, with-furnace operation maintaining its recent high level.



... CLEVELAND ...

... Ingot output in Ohio districts moves up two points as demand increases.

o o o

... General Motors releases large tonnages of body sheets for Fisher plants.

o o o

... Some price advances a possibility; galvanized sheets may be \$2 a ton higher.

CLEVELAND, Feb. 16.—With heavy backlogs, no falling off in the volume of new business and the release of held-up steel that has followed the ending of the General Motors strike, ingot output was increased two points this week in both the Cleveland-Lorain and the Youngstown districts, now being 80 per cent in the former and 81 per cent in the latter.

All the steel held up by the Fisher Body plant in Cleveland has been released and before the end of the week, sheets are expected to be flowing into the plant at the same volume as before the strike. Releases have also come from some of the other General Motors plants, but not in large lots as some of these plants had good stocks at the time of their shutdown. Some suppliers of parts for General Motors cars kept their plants operating during the strike and have built up stocks. Many of the mills have been able to take care of the early requirements of their customers, particularly in sheets during the period of the General Motors suspensions and now are putting the automotive tonnage back on their rolling schedules. New Demand for sheets continues heavy, but, with mills generally unable to take any more business for the current quarter, most of the new business is for the second quarter that will be billed at the prices prevailing at the time of shipment. One producer is now promising sheet deliveries all the way from May 15 to June 15. Heavy backlogs of orders for steel for railroad cars assure plate mills good operations for some time. Car orders placed from Dec. 1 until Feb. 15, will require 360,000

tons of plates, shapes and bars, according to figures compiled by steel producers. In wire products, fence and barbed wire are in brisk demand from jobbers, who are building up stocks for their spring trade.

With a wage advance a possibility, talk of price advances for the second quarter is persistent, but still lacks definiteness. A \$2 advance on galvanized sheets is predicted by some producers.

Scrap prices have again moved up on steel-making grades in Youngstown and blast furnace grades in Cleveland.

Pig Iron

Shipments continue heavier than in January. Some iron has been released that was suspended by foundries supplying plants in the Ohio River flood area, these foundries having secured releases of shipments of castings that have been temporarily held up. Considerable iron has also been released as a result of the settlement of the strike of the Hercules Motor Co., Canton, Ohio. Merchant furnaces are crowding production and are shipping all the iron they are making. Sales continue light and are confined mostly to car lots.

Sheets

Releases of sheets held up by the General Motors strike have started to come out and are expected to involve a heavy tonnage before the end of the week. Some plants had fair stocks when they were shut down and do not seem in a hurry to have shipments resumed. Miscellaneous demand, particularly from refrigerator manufacturers, continues heavy, as consumers are

anxious to get orders on producers' books in order to insure delivery when material is wanted. Considerable business has been taken for the second quarter subject to prices prevailing at the time of shipment. The demand at present appears heaviest for galvanized and hot rolled sheets. However, enameling sheets continue very active, particularly from stove manufacturers. Some of the mills can still take orders for electrical sheets for March delivery. Discussion of second quarter prices has brought out expressions of opinion that hot rolled sheets in lighter gages should be advanced, it being claimed that it is not profitable to make them at present prices. An advance of \$2 a ton on galvanized sheets is talked of.

Bars, Plates and Shapes

New business in steel bars continues good. Incoming tonnage with several of the mills is equal to shipments, so that there is no noticeable improvement in deliveries. Three weeks is about the best delivery promise that is being made. Some releases have come from forge shops that held up shipments during the General Motors strike. Miscellaneous plates order are fair and mills still have heavy backlogs. Activity in the construction field has subsided following the rush to place contracts at the old prices. Specifications are heavy for structural shapes for work recently awarded. Cleveland is asking for bids for an incinerator plant requiring 180 tons of shapes and reinforcing bars.

Strip Steel

Releases of small lots have come from General Motors plants and mills are receiving good specifications from automobile plants that were not affected by the strike. Miscellaneous demand is fair. Backlogs of hot rolled strip are sufficient with some mills to keep them fully employed for four to five weeks. Some producers can still take cold rolled strip for March shipment.

Iron Ore

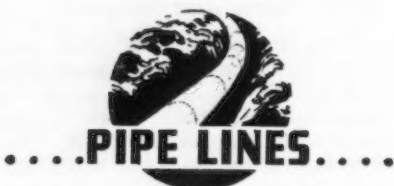
With the expectation of a much heavier demand for ore during the coming season than for several years, some consumers already are arranging for their requirements of certain grades and these will be made the basis of contracts later when prices are established.

Heavy shipments are being made from Lake Erie ports which are reducing dock stocks rather rapidly. These shipments during January were 586,871 tons, compared with 124,135 tons in January last

year. The dock balance Feb. 1 was 3,761,226 tons, against 4,969,841 tons on the same date a year ago and with 4,668,581 tons on April 1, last year.

Bolts, Nuts and Rivets

Demand for bolts and nuts is rather light, because consumers and jobbers purchased rather large stocks in December before the price advance and these have not been used up. Makers have considerable stock awaiting releases from General Motors plants and this is expected to start to move shortly. Demand for rivets has become slightly more active, indicating that consumers' stocks purchased at fourth quarter prices are getting rather low. The heaviest demand is from the railroad field.



Gulf Oil Corp., Gulf Building, Houston, Tex., has let contract to Latex Construction Co., Houston, for welded steel pipe line from bulk tank plant at Chatterton, Harrison County, Tex., in two main loops to booster pumping stations near Waskom and Carthage, Tex., respectively, total distance about 32 miles, for crude oil transmission. Cost over \$200,000. New lines will form a section of main welded pipe line to be built by company from oil field at Rodessa, La., to Lufkin, Tex. Additional pumping equipment will be installed in booster stations noted.

Larned, Kan., plans steel pipe line system for natural gas distribution, including main welded steel pipe line for supply to control plant. Cost about \$80,000. A special election is being arranged to vote bonds for project in amount noted.

United States Engineer Office, St. Paul, Minn., closes bids March 2 for 102 sections of steel shore pipe for dredge service (Circular 170).

Godfrey L. Cabot, Inc., Olean, N. Y., with headquarters at 77 Franklin Street, Boston, plans steel pipe lines in connection with development of natural gas properties in Clendening Corners gas field, near Akeley, Pa., including gathering system and main welded pipe line for natural gas transmission to lines of main system. Cost over \$100,000.

Danville, Va., B. A. Pollock, purchasing agent, closes bids March 1 for about 1285 ft. of 54 and 70-in. diameter welded steel pipe, for penstock for new municipal hydroelectric generating station near Pinacles of Dan River; also for steel surge tank and connections, 18-ft. diameter and 120 ft. high, to be located on Point Look-out near power station. Charles T. Main, Inc., 201 Devonshire Street, Boston, is consulting engineer.

Spokane, Wash., will take bids soon for 30-in. steel pipe line in Mayfair Street for trunk water service, connecting with existing 28-in. line in Euclid Street. New pipe line will be used in conjunction with main waterworks pumping station to be built in Hillyard section. At same time, bids will be asked for two main motor-driven pumping units and auxiliary equipment with rated capacity of 16,000,000 gal. in 24 hours. Water Department, A. Lindsay, superintendent is in charge.

Moundridge, Kan., has let contract to C. L. Burt, Hutchinson, Kan., for steel pipe line system for natural gas distribu-

tion. F. E. Devline, W-H-K Building, Wichita, Kan., is consulting engineer.

Ventura, Cal., has approved installation of 24-in. welded steel pipe line for water system in connection with improvements and replacements in main line from Casitas water intake to Kingston reservoir. Cost about \$25,000. Carl Froerer is city engineer.

Cheyenne, Wyo., will open bids Feb. 23 on 28,000 ft., approximately of various sized steel pipe.



Detroit, Toledo & Ironton is inquiring for 500 50-ton box cars and 300 50-ton automobile cars, 100 of latter to be equipped with racks.

Canadian Pacific has placed orders for 3600 freight cars as follows: 1900 box cars with Canadian Car & Foundry Co., 1100 box cars, 300 hopper cars, and 300 gondola cars with National Steel Car Corp.

Board of Transportation, City of New York, is asking bids until March 5 for 150 subway passenger cars for the Independent Subway System, previous bids having been rejected.

The Erie is inquiring for 80 milk cars.

Roberval & Saguenay is inquiring for one 2-8-2 type locomotive.

Pere Marquette has ordered 11 locomotive tenders from American Locomotive Co.

Canadian Pacific has ordered 30 4-6-4 locomotives and tenders from Montreal Locomotive Works, Ltd.

Louisiana & Arkansas has placed 100 box cars with Pullman-Standard Car Mfg. Co.

Mexican Railway has ordered 50 box cars from Pressed Steel Car Co.

Newburgh & South Shore is inquiring for 100 50-ton gondola cars.

Louisville & Nashville has ordered 27 50-ton Hart selective ballast cars from American Car & Foundry Co.

Grand Trunk Western is inquiring for 200 40-ton refrigerator cars and 200 50-ton automobile cars.

Chicago & Illinois Midland has ordered 100 hopper cars and 100 gondola cars from Pullman-Standard Car Mfg. Co.

Southern Pacific has ordered 41 passenger cars from Pullman-Standard Car Mfg. Co.

American Car & Foundry Motors Co. is in receipt of another order from Capital Transit Co., Washington, for 25 motor coaches.

The railroads and Pullman Co. on Jan. 1, had 8078 air-conditioned passenger cars in operation. J. J. Pelley, president of the Association of American Railroads, has announced. Since April 1, last, more than 1300 passenger cars have been equipped with air-conditioning devices. Of the total number of passenger cars which have been air conditioned, the railroads on Jan. 1 had 3926, which included 2293 coaches, 885 dining cars, and 748 other types of passenger equipment. The Pullman Co., Jan. 1, had 4152 air-conditioned passenger cars in service, which included sleeping cars, lounge cars and other passenger equipment.



Lowell, Mass., has placed an unstated tonnage of cast iron pipe with Lowell Iron & Steel Co.

Amesbury, Mass., has private plans for a water system extension. P. A. Sanborn is head of water department.

Swanton, Vt., has awarded a round tonnage of pipe and fittings to Central Foundry Co., 420 Lexington Avenue, New York.

Boston has awarded 100 tons of 4-in. to United States Pipe & Foundry Co.

Bethlehem, Pa., plans main pressure pipe line for water supply from new source in Pocono Mountain district, and extensions and replacements in distributing lines in municipal limits. Entire project will cost close to \$2,000,000. Special election will be called soon to approve funds for project. R. L. Fox, City Hall, is city engineer.

Eufaula, Ala., plans pipe lines for water system and other waterworks installation. Fund of \$105,000 is being arranged through Federal aid.

New Baden, Ill., closes bids Feb. 26 for pipe lines for water system and other waterworks installation. Cost about \$30,000. Financing has been arranged through Federal aid. E. A. Fulton, 3 South Merriam Street, St. Louis, is consulting engineer.

Lake Township, Milwaukee County, Wis., has applied for PWA grant of \$521,600 toward cost of \$1,200,000 combination waterworks plant and distribution system and municipal building. Eugene P. Dunn, 3906 South Howell Avenue, Milwaukee, is town clerk.

Milwaukee has placed about 125 tons of gate and tapping valves with M. & H. Valve & Fitting Co., Anniston, Ala.

Hiawatha, Kan., plans pipe lines for extensions and replacements in water system; also other waterworks installation. Fund of \$38,100 is being arranged through Federal aid. Black & Veatch, 4706 Broadway, Kansas City, Mo., are consulting engineers.

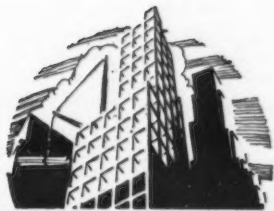
Elsmere, Ky., plans about four miles of pipe for main water lines; also elevated steel tank and tower and other waterworks installation. Cost about \$100,000. R. C. Stout, Elsmere, is engineer.

Rome, Ga., plans pipe lines for water system, including new mains and replacements in present lines; also other waterworks installation. Fund of \$240,000 is being arranged through Federal aid.

Sisseton, S. D., will take bids soon for 24,000 ft. of 4 and 8-in. for water system; also for equipment for water treatment plant and other waterworks installation. Cost about \$80,000. Dakota Engineering Co., Western Building, Mitchell, S. D., is consulting engineer.

Jackson County Public Water District No. 1, care of John N. Maddin, 1201 Bryant Building, Kansas City, Mo., attorney and representative, has rejected bids recently received and will ask new bids soon for pipe for water distributing system near Grandview, Mo., totaling about 33 sq. miles, including trunk line connection with main line at Kansas City; also for 250,000-gal. elevated steel tank and tower, and other waterworks installation. Cost about \$325,000. Charles A. Haskins & Co., Finance Building, Kansas City, Mo., are consulting engineers.

Toledo, Ore., plans pipe lines for water system, including main pressure line from Siletz River, intake source, to municipal limits for trunk main, about seven miles long; also 1,250,000-gal. reservoir and other waterworks installation. Bond issue of \$96,780 is being arranged for project. Beasley & Stoehr, Portland, are consulting engineers.



... NEW YORK ...

... Export demand increases sharply; Japan a large buyer.

... Sold-up condition of European mills drives business here.

... Domestic orders continue at a steady pace.

NEW YORK, Feb. 16.—The feature of steel business here in the past week has been a sharp increase in export demand, principally from Japan. The withdrawal for two years of the import duty on iron and steel by the Nippon government brought a sharp demand for various products, including tin plate, sheet bars and billets. Large purchases, probably totaling about 75,000 tons, were made by the Mitsui and Mitsubishi companies for shipment to Japan. A large portion was tin plate, but there were also sizable tonnages of semi-finished steel.

The sold-up condition of British and German mills, together with the shortages there of pig and scrap, which make it virtually impossible to expand output any further, is forcing many foreign countries to come to the United States for steel that ordinarily would be purchased in Europe. On some products German mills quote deliveries of nearly a year. Steel companies are receiving many inquiries on which they decline to quote. Wire rods are in demand, but American mills can make more money by converting them into finished wire products, on which they are scarcely able to keep up with the domestic demand, which has increased sharply in expectation of higher prices in the second quarter.

Domestic business is holding at a good volume. In fact, district sales offices frequently have difficulty in getting their home offices to accept business that is offered. In sheets the situation is further complicated by the resumption of activities by General Motors Corp. As General Motors orders have been on the books for some time, though shipments were suspended,

most mills are giving precedence to those orders over miscellaneous business that was placed later. In some specialty products the mills have put district offices on a quota basis.

No official information is obtainable as to steel prices for second quarter, but it is generally understood that wire products and pipe, excepting seamless, will be advanced, and there is a possibility that galvanized sheets may be higher, owing to advancing zinc prices, but it is doubted that any change will be made on uncoated sheets. Prices are firm except on tin plate, on which concessions have been reported, possibly a reflection of the highly competitive situation in cans, which has been brought about by the entrance of new companies into the field.

Pig Iron

Some furnaces along the Atlantic seaboard which have been quietly selling parcels of iron abroad at the full domestic price are refusing to accept any more business, as stocks are exhausted. Considerable quantity of iron for foreign use is already under contract, Japan having purchased well over 100,000 tons in addition to purchases by other countries. Greece has been one country to buy recently. With a further absorption of American supplies by foreign countries anticipated, the probability of a shortage of iron is becoming increasingly real. While domestic consumers are inactive buyers at present, they continue to take heavy shipments, thereby contributing to a strong situation. The likelihood of a price increase for the second quarter has accordingly strengthened, but action may be delayed until the last minute to enable producers to study details

of the threatened coal strike. If this develops, conditions in the pig iron industry would rapidly become critical. Owing already to a large consumption, inadequate coke supplies, high scrap prices, foreign competitive buying, pending increase in iron ore costs, higher wages for labor and diversion of blast furnace capacity to steel-making requirements, the iron market has entered a phase that calls for close watching.

Reinforcing Steel

No awards of over 100 tons have been reported this week, and the volume of smaller orders has been light. Pending are several fair-sized jobs, among which are the St. Lawrence River bridge at Watertown, N. Y., requiring about 650 tons of bars, and another section of the West Side elevated highway involving 700 tons of bars. The Sheffield Farms building reported last week will need about 400 tons of bars, and bids will be taken Feb. 20. No award has yet been made of the 1000 tons of reinforcing steel for the Coca Cola building at Kearney, N. J. It has been heard that this delay is being caused by threats of strikes throughout New Jersey.

Wire Products

January bookings in the office of one large seller of wire products here exceeded those of any other month last year excepting December, and from present indications February sales will be only slightly behind those of January. It is practically certain that the price of fence fabric will be advanced, probably around \$2 per ton, while other products, including manufacturers' wire may remain at present price levels. That nails will be increased in price is being taken almost for granted in the trade. Deliveries for the general run of wire products require from one to three weeks, while strip is not obtainable for five to ten weeks.

Plates

The three boats reported two weeks ago as being designed by Theodore Ferris for an unstated operator have been ordered by the Philadelphia & Norfolk Steamship Co., the architects disclosed last week. Pusey & Jones Corp., Wilmington, Del., was announced as low bidder for the construction of the vessels, each of which will probably require 1000 tons of plates. The contract is not expected to be awarded for about two weeks. Orders continue to come in at about the same rate as last week, with no outstanding pending projects being reported.



**...Pooling of scrap
agreed to by steel pro-
ducers.**

o o o

**...Export ban applied
for; pig iron business
virtually suspended.**

LONDON, Feb. 16 (By Cable)
—Famine conditions in pig iron and scrap departments are the chief obstacles to a much-needed steel output expansion, and some steel furnaces may have to be shut down. With the object of overcoming the scrap shortage, British steel makers have agreed to a central control of national supplies. An export ban has been applied for. Pig iron business has been suspended almost completely, although consumers are offering high premiums for early deliveries.

Foreign Trade Items

Exports of farm equipment from the United States in December were valued at \$4,094,787, more than double the corresponding shipments in 1935, which amounted to \$1,898,881, according to the machinery division, Department of Commerce. Practically all items shared in this advance, the greatest increase being registered by track-laying tractors. Exports for the year totaled \$43,993,215, approximately 37 per cent above the 1935 figure. Foreign sales increased in all major types of farm equipment except grain binders and combines. Exports for the latter declined more than 50 per cent. Shipments of tractors and parts increased 55 per cent over the 1935 total, and accounted for 65 per cent of the total 1936 exports.

During the first 10 months of 1936 India's exports of pig iron to Japan totaled 325,000 tons out of a total for the period of 509,000 tons, and a representative of Japanese steel interests is understood to be in India now endeavoring to negotiate for the purchase of 1,000,000 tons of iron during the current year. Production of pig iron in India from January to October, 1936, totaled 1,168,102 tons, of

Imports of Continental semi-finished steel fall short of the agreed quotas and the British makers are unable to supply the deficiency.

Home demand for finished steel, especially structural steel, is unrelaxed. All mills have enormous rolling programs and fresh business in angles, joints, is accepted only for far-forward delivery.

The tin plate output is curtailed by the steel shortage, and some makers are unable to quote for early delivery, and others are refusing forward business. Italian and German makers are sold out. Welsh makers are asking 10s. to 20s. over scheduled prices.

Continental iron and steel demand is strong, but business is small, as makers are heavily sold and are refusing further orders owing to the scrap, ore and coke shortage and the likelihood of higher prices.

Continental and British export prices on black and galvanized sheets are raised 20s. Other prices are unchanged.

Pig iron exports for January amounted to 13,000 tons, of which none was shipped to the United States. Total exports of iron and steel amounted to 215,000 tons.

which 660,000 tons was accounted for by domestic consumers.

The acceleration in British industry in 1936, accompanied by the increased demand for skilled labor, has sharply advanced the demand in Great Britain for labor-saving equipment, according to Commerce Department reports from London. The expansion is reflected in the official totals of insured workers, which were recorded at 10,896,000 in 1936, compared with 519,000 in the preceding year. American machinery interests are said to have benefited greatly by this tendency, and the high production and labor-saving features of American machines are undoubtedly the outstanding factor in the British demand, the report stated. Machine tool imports in 1936 aggregated \$18,010,000, of which American products accounted for \$11,595,000, an increase of 126 per cent over 1935, and 64 per cent of the total.

Production of steel ingots in England exceeded by a substantial majority all previous annual totals, and during each of the last four months of the year were in excess of 1,000,000 tons. The monthly average in 1936 amounted to 974,900 tons, compared with 821,600 tons in 1935 and 638,600 tons in 1913.

Belgium has been purchasing increasing quantities of tin plate abroad in the last three years, according to a statement from a commercial attache in Brussels. Great Britain, Germany, the United States and France, in the order named, were the largest suppliers of tin plate to Belgium during 1936, imports from this country registering the greatest advance, increasing from 21 metric tons in the first ten months of 1935 to 3395 tons in the same period of 1936. British imports also increased, while those from Germany and France declined.

British Company to Enlarge Steel Plant

LONDON (Special Correspondence).—The United Steel Companies, Ltd., Britain's biggest iron and steel combine, is to spend £3,500,000 (\$17,500,000) on new plant at the Appleby works of its branch at Scunthorpe during the next few years.

This announcement was made by Sir Walter Benton Jones, chairman. Improvements will include four new blast furnaces, duplication of the Appleby steel plant, new coke ovens, a new sintering plant, and a new gas holder. The complete project will eventually cost £3,500,000, but at present the combine intends to proceed with only one-half of each unit, at a cost of £2,500,000 (\$12,500,000). The contract for the new coke ovens is to be let in February, and plans for the first two blast furnaces are already in preparation. One of the steel furnaces is under construction. When the whole project is completed the combine will be able to turn out 1,000,000 tons of pig iron and 1,000,000 tons of steel a year at its Scunthorpe works.

Sir Walter concluded his announcement by stating that the present prosperity of the British iron and steel industry was not exaggerated in any degree by armaments requirements.

Based on f.o.b. plant prices, the total value of products manufactured in 1935 by the structural and ornamental metal work industry was \$160,762,487, an increase of 49.4 per cent over \$107,612,309 reported for 1933 according to the Bureau of the Census. The wage earners employed in 1935 numbered 27,243, an increase of 27.4 per cent over 21,377 reported for 1933, while wages aggregated \$28,225,011 and \$18,624,134, respectively.

Finished Steel Production for Sale in 1936 Gained 41 Per Cent Over 1935 Total

PRODUCTION of finished and semi-finished steel for sale during 1936 amounted to 36,297,248 gross tons, according to a report of the American Iron and Steel Institute. This figure includes 5,112,895 tons of various products sold to members of the industry for further conversion, leaving 31,184,389 tons as the amount that was sold for consumption without further processing by steel mills.

The 31,184,389 tons compare with 22,109,855 tons in 1935 (an increase of 41 per cent), with 17,423,843 in 1934, and with 15,330,984 in 1933, the first year that this compilation was made.

There was a considerable gain in export shipments—1,135,167 tons against 895,148 in 1935, also a sharp increase in a number of products sold into domestic consumption. Sheet mill and tin mill

products were far in the lead in average output in the year. The 7,008,312 tons of sheets produced represented 78.5 per cent of the industry's capacity; the tin plate total was 2,108,916 tons, or 79.4 per cent of capacity, and black plate output was 375,359 tons, or 76.1 per cent of capacity.

Detailed figures for the fourth quarter and the year 1936 are given in the table below.

Production of Steel Products for Sale in Fourth Quarter and Full Year, 1936

STEEL PRODUCTS:	Number of Companies	Items	Annual Capacity, Gross Tons	Production for Sale—Gross Tons				To Date (12 Months, 1936)			
				Current Quarter		Shipments		To Date		Shipments	
				Total	Per Cent of Capacity	Export	To Members of the Industry for Conversion into Further Finished Products	Total	Per Cent of Capacity	Export	To Members of the Industry for Conversion into Further Finished Products
Ingots, blooms, billets, slabs, sheet bars, etc.	33	1	.....	1,068,639	...	6,060	686,504	4,433,976	...	21,714	3,360,779
Heavy structural shapes	9	2	5,220,720	563,206	43.2	19,722	.....	2,233,218	42.8	61,858	.....
Steel piling	4	3	265,000	28,640	43.2	553	.....	109,649	41.4	2,790	.....
Plates—Sheared and Universal	23	4	6,413,549	655,664	40.9	45,912	4,604	2,321,201	36.2	99,604	18,931
Skelp	8	5	.....	168,345	...	31,128	96,998	620,286	...	66,534	373,795
Rails—Standard (over 60 lb.)	4	6	3,975,000	194,893	19.6	3,735	.....	1,062,882	26.7	13,033	.....
Light (60 lb. and under)	7	7	805,820	25,923	12.9	545	.....	92,189	11.4	8,451	.....
All other (Incl. girder, guard, etc.)	2	8	140,000	6,545	18.7	1,153	.....	42,574	30.4	5,351	.....
Splice bar and tie plates	15	9	1,608,793	89,871	22.3	1,345	.....	410,540	25.5	3,362	.....
Bars—Merchant	42	10	.....	1,123,074	...	12,928	148,736	3,810,436	...	41,095	462,552
Concrete reinforcing	30	11	.....	205,875	...	4,708	.....	937,827	...	15,127	.....
Cold finished—Carbon	18	12	.....	183,154	...	932	.....	620,423	...	4,788	.....
Alloy—Hot rolled	14	13	.....	201,375	...	964	10,785	680,557	...	4,178	41,407
Cold finished	12	14	.....	19,291	...	184	.....	68,825	...	455	.....
Hoops and baling bands	3	15	.....	16,035	...	117	.....	68,699	...	1,337	.....
Total bars	61	16	12,978,600	1,748,804	53.9	19,833	159,521	6,186,767	47.7	66,980	503,959
Tool steel bars (rolled and forged)	16	17	101,323	10,646	42.0	33	33	36,330	35.9	133	.....
Pipe and tube—B. W.	16	18	1,833,999	206,083	44.9	6,869	.....	756,770	41.3	18,291	.....
L. W.	11	19	1,739,534	154,975	35.6	7,232	.....	577,411	33.2	16,201	.....
Electric weld	3	20	813,571	31,940	15.7	297	.....	141,424	17.4	534	.....
Seamless	15	21	2,655,978	365,252	55.0	12,109	.....	1,337,937	50.4	31,492	.....
Conduit	6	22	142,350	20,413	57.4	432	.....	66,420	46.7	1,486	.....
Mechanical tubing	5	23	226,900	32,256	56.9	1,300	.....	109,214	48.1	3,598	.....
Wire rods	19	24	.....	219,068	...	6,332	72,771	720,503	...	33,021	267,761
Wire—Drawn	39	25	1,767,402	353,254	79.9	12,918	8,066	1,180,029	66.8	48,224	24,212
Nails and staples	20	26	1,102,093	162,722	59.1	2,897	.....	544,510	49.4	11,816	.....
Barbed wire and fence	17	27	1,169,735	94,843	32.4	10,791	.....	386,691	33.1	37,003	.....
Bale ties	11	28	114,069	12,102	42.4	87	.....	51,177	44.9	196	.....
All other wire products	7	29	112,800	8,707	30.9	26	.....	43,265	38.4	158	.....
Fence posts	16	30	149,550	18,541	49.6	109	.....	63,833	42.7	533	.....
Black plate	13	31	493,079	112,201	91.0	2,007	31,423	375,359	76.1	7,347	120,272
Tin plate	15	32	2,656,680	538,124	81.0	67,157	.....	2,108,916	79.4	289,678	.....
Sheets—Hot rolled	20	33	.....	447,128	...	4,861	4,634	1,576,394	...	25,371	87,801
Hot rolled annealed	22	34	.....	565,091	...	16,365	341	1,856,909	...	52,186	2,840
Galvanized	16	35	.....	310,539	...	19,641	.....	1,048,891	...	63,566	.....
Cold rolled	17	36	.....	625,928	...	16,770	.....	2,025,823	...	71,320	.....
All other	16	37	.....	153,390	...	2,576	.....	500,295	...	10,335	.....
Total sheets	30	38	8,923,849	2,102,076	94.2	60,213	4,975	7,008,312	78.5	222,778	90,641
Strip—Hot rolled	29	39	3,550,031	633,250	71.4	11,096	106,748	2,214,595	62.4	41,722	352,545
Cold rolled	39	40	1,151,013	232,236	80.7	2,758	.....	710,363	61.7	11,454	.....
Wheels (car, rolled steel)	5	41	398,284	32,659	32.8	120	.....	131,252	33.0	1,256	.....
Axles	5	42	425,900	18,968	17.8	52	.....	67,072	15.7	418	.....
Track spikes	11	43	350,260	28,285	32.3	216	.....	102,345	29.2	1,056	.....
All other	6	44	.....	25,764	...	1,752	.....	50,274	...	7,095	.....
Total steel products	150	45	.....	9,964,895	...	336,789	1,171,610	36,297,284	...	1,135,167	5,112,895
Estimated total steel finishing capacity based on a yield from ingots of 68.2 per cent	..	46	46,034,000	.....	76.4	.....	.....	.....	67.7	.....	.....
IRON PRODUCTS:											
Pig iron, ferromanganese and spiegel	31	47	.....	1,613,162	...	4,822	581,043	5,466,377	...	6,983	1,863,761
Ingots molds	5	48	.....	106,679	...	714	.....	362,340	...	3,534	.....
Bars	13	49	234,019	17,680	30.2	8	303	62,284	26.6	57	1,177
Pipes and tubes	4	50	185,457	13,206	28.5	425	.....	52,973	28.6	868	.....
All other	5	51	151,960	11,697	30.8	345	550	49,018	32.3	843	3,902
Total iron products (items 49 to 51)	17	52	513,476	42,583	33.2	778	853	164,275	32.0	1,768	5,079

Total companies included—175.

Total steel products produced for sale, less shipments to members of the industry for conversion into further finished products: Current quarter, 8,793,285 gross tons; 76.4 per cent of finishing capacity. To date, 31,184,389 gross tons; 67.7 per cent of finishing capacity. The above tonnages represents 68.2 per cent of the ingots produced by companies whose products are included above.



FABRICATED STEEL

... Lettings in good volume at 39,430 tons compared with 25,630 tons last week.

• • •

... New projects decline to 17,065 tons from 27,400 tons a week ago.

• • •

... Plate awards call for 1960 tons.

NORTH ATLANTIC STATES

Attleboro, Mass., 100 tons, bridge, to Bethlehem Steel Co.

New York, 185 tons, Spear warehouse, 117 West 21st Street, to Harris Structural Steel Co., Plainfield, N. J.

Depew, N. Y., 110 tons, Lehigh Valley Railroad bridge, to Bethlehem Steel Co.

Queens County, N. Y., 235 tons, highway bridge, to American Bridge Co.

Hudson, N. Y., 450 tons, Universal Atlas Cement Corp., to American Bridge Co.

Tompkins County, N. Y., 174 tons, highway bridge, to Bethlehem Steel Co.

Delaware County, N. Y., 190 tons, highway bridge, to American Bridge Co.

Rochester, N. Y., 1350 tons, Pfadler & Co. factory building, to American Bridge Co.

Lock Haven, Pa., 260 tons, State highway bridge, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Entriken, Pa., 270 tons, State highway bridges, to Fort Pitt Bridge Works Co.

State of Delaware, 310 tons, temporary supports, alterations to bridge for Pennsylvania Railroad, to Phoenix Bridge Co., Phoenixville, Pa.

Wilmington, Del., 150 tons, duPont addition, to Bethlehem Steel Co.

Chesapeake City, Del., 380 tons, alterations to Pennsylvania Railroad bridge over Chesapeake and Delaware canal, 190 tons each to American Bridge Co. and Phoenix Bridge Co.

Glassboro, N. J., 100 tons, Owens-Illinois Glass Co. building, to Frank M. Weaver, Lansdale, Pa.

THE SOUTH

Houston, Tex., 600 tons, bridge, to Virginia Bridge Co.

Beverly, Tex., 600 tons, tainter gates, to Lakeside Bridge & Steel Co., Milwaukee.

CENTRAL STATES

Merom, Ind., 700 tons, bridge, to Wisconsin Bridge & Iron Co., North Milwaukee.

Dixon, Ill., 500 tons, State hospital, to Mississippi Valley Structural Steel Co., St. Louis.

Villa Park, Ill., 250 tons, railroad grade separation, to Bethlehem Steel Co.

Lombard, Ill., 470 tons, railroad grade separation, to Bethlehem Steel Co.

Anna and Peoria, Ill., 180 tons, warehouses, to Mississippi Valley Structural Steel Co.

Charleston, Ill., 280 tons, college building, to Mississippi Valley Structural Steel Co.

St. Paul, Minn., 310 tons, State horse barn, to St. Paul Foundry Co.

Stevens Point, Wis., 400 tons, high school, to Kupfer Foundry & Iron Co.

Menasha, Wis., 125 tons, high school, to Worden-Allen Co., Milwaukee.

WESTERN STATES

Los Angeles, 20,000 tons, post office and jail, to Consolidated Steel Corp.

Los Angeles, 10,000 tons, Union terminal railroad station, to Consolidated Steel Corp.

Los Angeles, 750 tons, three buildings for Aluminum Co. of America, to Bethlehem Steel Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Waterbury, Conn., 200 tons, building, American Brass Co.

New York, 500 tons, addition to building, Columbia-Presbyterian Medical Center.

New York, 500 tons, Delaware aqueduct shafts, contracts Nos. 333 and 334.

New York, 260 tons, foundations, West side elevated highway.

New York, 3000 tons, 57th Street plant, Sheffield Farms Co.

Yaphank, N. Y., 300 tons, Suffolk County infirmary building.

Ovid, N. Y., 250 tons, central school; bids Feb. 19.

Sharon, Pa., 300 tons, extension to foundry building, National Malleable & Steel Casting Co.

SOUTH AND SOUTHWEST

Watonga, Okla., 575 tons, bridge.

CENTRAL STATES

Port Huron, Mich., 8850 tons, Port Huron-Sarnia International Bridge, State Bridge Commission. Steel will be let in three sections, Canadian and Michigan approaches, 2425 and 2225 tons respectively. Bridge span 4200 tons.

Cleveland, 180 tons, 110 tons structural shapes and 70 tons reinforcing bars for Southerly sewage disposal plant incinerator building; bids Feb. 25.

Youngstown, 700 tons, crane runway, Republic Steel Corp.

Milwaukee, 250 tons, shop extension for Heil Co.; Klug & Smith Co., Milwaukee, general contractor.

Rochester, Minn., 200 tons, Montgomery Ward & Co. store.

Atchison, Kan., 1600 tons, Kansas-Missouri interstate bridge; Wisconsin Bridge & Iron Co., low bidder.

WESTERN STATES

Seattle, 1000 tons, seaplane hangar, Government Naval Air Station.

FABRICATED PLATES

AWARDS

Hartford, Conn., 575 tons, pipe for Metropolitan Water District, to Alco Products Co., Dunkirk, N. Y.

St. Louis, 235 tons, deck barge, to Ingalls Iron Works Co.

Kansas City, Mo., 1150 tons, 24-in. gas pipe line, to A. O. Smith Mfg. Co., Milwaukee.



REINFORCING STEEL

... Awards of 6980 tons—3235 tons in new projects.

AWARDS

Manchester, N. H., 550 tons, bridge; 375 tons to Concrete Steel Co., 175 tons to Truscon Steel Co.

Baltimore, 616 tons, Monte Bello tunnel for Baltimore Water Works, to Bethlehem Steel Co.

Wilmington, Del., unstated tonnage, factory building for Delaware Hard Fiber Co., to Taylor Davis Co., Philadelphia.

Covington, Ky., 244 tons, school building, to Pollak Steel Co.

Cincinnati, 130 tons, warehouse for Heekin Can Co., to Pollak Steel Co.

Chicago, 100 tons, Sanitary District work, to Concrete Engineering Co.

Detroit, 235 tons, merchandise mart, to Joseph T. Ryerson & Son, Inc.

Los Angeles, 4800 tons, post office and jail, to Consolidated Steel Corp.

Santa Fe, N. M., 130 tons, bus terminal, to Bethlehem Steel Co.

NEW REINFORCING BAR PROJECTS

PENDING

New York, 700 tons, West side elevated highway, 135th to 146th Streets; bids taken Feb. 16.

New York, 400 tons, Sheffield Farms building; bids Feb. 20.

Watertown, N. Y., 650 tons, St. Lawrence River bridge; bids to be taken March 2 by Thousand Island Bridge Authority, Watertown.

Salamanca, N. Y., 100 tons, sewage disposal plant; Street Brothers, Syracuse, low bidder.

Silver Creek, N. Y., 150 tons, grade crossing elimination.

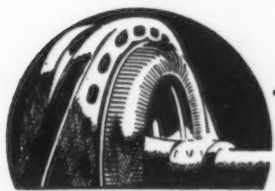
Ovid, N. Y., 100 tons, central school; bids Feb. 19.

Morristown, N. J., 388 tons, high school; Herzog Construction Co., general contractor. Bids in.

Stockton, Cal., 500 tons, State hospital; bids Feb. 24.

Los Angeles, 145 tons, road construction; bids March 4.

Sacramento, Cal., 100 tons, hospital addition; bids postponed indefinitely.



...NON-FERROUS...

... **Copper boosted to 14c. Valley basis; statistics show large decline in stocks.**

... **Zinc stocks equivalent to less than a month's needs.**

NEW YORK, Feb. 16.—Copper producers raised the price of the metal for domestic consumption to 14.00c. a lb., Valley basis, today for electrolytic grade, and Lake copper was advanced to 14.12½c., Eastern delivery. The in-

crease materialized from expectations that a mounting export price would necessitate upward revision of the domestic level, but a further incentive toward such action was supplied by the appearance of the industry's statistics for Janu-

ary. Domestic sales reached 3293 tons yesterday, and the month's total bookings rose to 35,307 tons. With offerings scarce, demand is currently reported pursuing an active course. Demand for export is strong, and transactions are being based on a price ranging up to 13.87½c., c.i.f., Europe.

Lead

Demand continues in satisfactory volume, with prices steady and firm at 6.00c. and 6.05c. a lb., New York, and 5.85c., St. Louis. Beyond the usual run of small-lot customers who habitually buy for prompt shipment, current sales are for March position, with that month's needs estimated to be about 50 per cent covered. Business placed with the largest producer is running a bit heavier than in other directions, and this interest has been able to dispose of its intake from day to day with a minimum of effort.

Zinc

Stocks of all grades of zinc declined 10,613 tons during January to total 34,143 tons at the period's end. Shipments were off 9183 tons to a total of 50,638 tons. Production dropped 7025 tons to 40,025 tons. Stocks were equal to less than a month's needs. In prime Western grade metal, the statistics showed a decline in the stocks of 8690 tons to 30,292 tons, or approximately equal to currently monthly consumption as based on January shipments of this grade of 29,931 tons. Tightness of supplies continued to be a factor in restraint of trading last week. Producer offerings were scant, and in some cases withheld altogether, while demand exceeded offerings. The bulk of consumers are, however, rather well covered against normal needs. Prices for the metal held unchanged all week at the recent advance to a 6.40c., East St. Louis level.

Tin

Coincident with the closing of Eastern tin markets at last mid-week in observance of the Chinese holiday, fair volume of trading developed here by professionals who could not obtain supplies from the usual source. Consumers shared in the turnover to some extent. Prices at the time were around a 50c. level, but as the market began to move higher, inquiry dried up, and on subsequent days little additional interest developed. Demand at the moment is inactive, with spot Straits metal at New York quotable at about 51.50c. a lb. The morning's standard prices in London were £230 5s. cash and £231 5s. three-months. The Eastern quotation was £232 2s. 6d.

The Week's Prices. Cents Per Pound for Early Delivery

	Feb. 10	Feb. 11	Feb. 12	Feb. 13	Feb. 15	Feb. 16
Electrolytic copper, Conn.*....	13.00	13.00	13.00	13.00	13.00	14.00
Lake copper, N. Y.....	13.12½	13.12½	13.12½	13.12½	13.12½	14.12½
Straits tin, spot, New York....	50.65	51.25	51.25	51.25	51.00	51.50
Zinc, East St. Louis.....	6.40	6.40	6.40	6.40	6.40	6.40
Zinc, New York.....	6.75	6.75	6.75	6.75	6.75	6.75
Lead, St. Louis.....	5.85	5.85	5.85	5.85	5.85	5.85
Lead, New York.....	6.00	6.00	6.00	6.00	6.00	6.00

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
Aluminum, virgin 99 per cent plus 19.00c.-21.00c. a lb. delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 17.00c. a lb. delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 14.25c. a lb., New York.
Quicksilver, \$90.00 to \$92.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 13.75c. a lb. delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.	
Tin, Straits pig....	52.50c. to 53.50c.
Tin, bar.....	54.50c. to 55.50c.
Copper, Lake.....	14.75c. to 15.75c.
Copper, electrolytic....	14.75c. to 15.75c.
Copper, castings....	14.00c. to 15.00c.
*Copper sheets, hot-rolled.....	20.37½c.
*High brass sheets.....	18.12½c.
*Seamless brass tubes.....	20.87½c.
*Seamless copper tubes.....	21.37½c.
*Brass rods.....	16.12½c.
Zinc, slabs.....	7.50c. to 8.50c.
Zinc, sheets (No. 9), casks, 1200 lb. and over.....	10.75c.
Lead, American pig. 7.00c. to 8.00c.	
Lead, bar.....	8.00c. to 9.00c.
Lead, sheets, cut....	8.75c.
Antimony, Asiatic ..	15.00c. to 16.00c.
Alum., virgin, 99 per cent plus.....	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent.....	18.50c. to 20.00c.
Solder, ½ and ⅓.....	31.50c. to 32.50c.
Babbitt metal, commercial grades ..	25.00c. to 65.00c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 33¼ per cent allowed off for extras, except copper tubes and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse

Delivered Prices per Lb.	
Tin, Straits pig.....	55.12½c.

Tin, bar.....	57.12½c.
Copper, Lake.....	14.12½c. to 14.25c.
Copper, electro-lytic.....	14.12½c. to 14.25c.
Copper, castings....	13.87½c. to 14.00c.
Zinc, slabs.....	6.50c. to 6.75c.
Lead, American pig. 6.50c. to 6.60c.	
Lead, bar.....	9.25c.
Antimony, Asiatic ..	16.50c.
Babbitt metal, medium grade.....	22.00c.
Babbitt metal, high grade.....	59.25c.
Solder, ½ and ⅓.....	33.50c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.....	10.12½c.	10.87½c.
Copper, hvy. and wire.....	10.00c.	10.50c.
Copper, light and bottoms.....	9.00c.	9.25c.
Brass, heavy.....	6.12½c.	6.75c.
Brass, light.....	5.25c.	6.00c.
Hvy. machine composition.....	9.25c.	9.75c.
No. 1 yel. brass turnings.....	7.37½c.	7.87½c.
No. 1 red brass or compos. turnings.....	8.87½c.	9.37½c.
Lead, heavy.....	5.00c.	5.27½c.
Cast aluminum.....	12.12½c.	13.25c.
Sheet aluminum ..	13.25c.	14.75c.
Zinc.....	3.00c.	3.37½c.



IRON AND STEEL SCRAP

... Composite price advances to \$19.25, reflecting rises at Pittsburgh and Chicago.

• • •

... All principal markets display sustained buoyancy.

WITH steel mill operations continuing to show unseasonal advances, the scrap markets all over the country are increasingly bullish. Under the influence of heavy domestic demands and sizable export shipments, there is still no telling when the upward march in prices will be halted. At Pittsburgh steel-making scrap has been sold into consumption at \$20, and Chicago mills have paid \$19.50 to \$20. Reflecting these increases, the composite figure for the entire country is 25c. higher at \$19.25 a gross ton. Consumer interest around Cleveland and in eastern Pennsylvania is lagging, but the latter market is well supported by heavy export purchases. In addition to a sizable backlog of Japanese and Italian business, there are inquiries current from England.

Pittsburgh

No. 1 steel has been sold into consumption in the past week at \$19.75 and \$20 a ton, making the market quotable at \$19.50 to \$20. Moderately-sized tonnages were involved and represent the first consumer sales in a number of weeks. A small tonnage of compressed sheets was also purchased at \$20 a ton. The market continues strong and supplies are still far from plentiful. With operations in this district at a post-depression high, dealers are looking for substantial purchases in the near future.

Chicago

Heavy melting steel and long list of other grades have moved to higher price levels, and there appears not to be a single weak factor in the market. Mills have paid \$19.50 a gross ton, delivered, for heavy melting steel and the railroads are freely paid within a few cents of \$20 by anxious dealers. Brokers' trades are free at \$20 for a car or two. Heavy tonnages on upper Great Lakes docks

are overhanging the market. Usually this material moves East, but there is a possibility that Chicago users may see fit to bid in some of the tonnage when navigation opens.

Cleveland

The market remains very firm in spite of the absence of consumer purchases. Blast furnace grades have advanced 25c. a ton with brokers paying \$13 for borings and turnings. Steel-making scrap has advanced 50c. a ton in the Youngstown district, where brokers are paying \$19 to \$19.50 for No. 1 steel, \$18.50 to \$19 for compressed sheets and \$14.50 to \$15 for turnings. While brokers are able to buy scrap at present quotations to fill outstanding orders, the supply is not in excess of the demand.

Philadelphia

The market is quiet at the moment, although two district mills are expected soon to renew buying. There is no weakness in the current quotations of \$18.50 for No. 1 and \$17.50 to \$18.00 for No. 2, however, as the leading purchaser in the district is paying \$18 to \$18.25 for No. 1 steel, and \$1 less for No. 2. Brokers believe that the next sale will bring \$19 for No. 1 and \$18 for No. 2. Export buying prices are unchanged, and scrap seems to be moving freely in response to the \$18 and \$17 offers. A boat sailed Tuesday for an unstated destination, believed to be Japan, with about 5000 tons of steel scrap. An estimated 20,000 to 25,000 tons is on sidings at Port Richmond awaiting boats, which are currently difficult to obtain.

Buffalo

This market continues strong with another tonnage of material reported sold to a local mill. All three of the largest consumers have now come into the market within the past three weeks. The latest transaction involved an estimated 5000 tons of No. 1 steel at \$19. Sales of cupola cast

and No. 1 machinery are noted in Buffalo at \$17 and \$18 respectively.

Boston

Prices are very strong but unchanged with the exception of Nos. 1 and 2 steel. Pittsburgh consumers are offering \$20 a ton delivered for No. 1, but are obtaining practically nothing. It is reported that exporters have raised offers for No. 1, but no actual sales were made the past week at better than \$16.50 a ton, delivered army base. England is again a factor in the export market, buying No. 2 cast, engine blocks, steel turnings and No. 2 steel, as well as No. 1 steel. Two boats are here, one to load 5500 tons for Japan, and the other 5000 tons for England.

New York

Supplies are tightening up, as there has been no curtailment of active consumption for quite some time. Dealers' buying prices for principal steel grades are unchanged, however, but steel car axles have been boosted \$1 a ton, as has railroad wrought scrap. Export continues to be an active outlet for material, and Japan in particular has been a large buyer.

Detroit

This market continues strong, and the effect of the General Motors strike settlement has tended to make it more bullish in tone. A sale of 210 cars of bundles by a body group brought new high prices for this category, and was taken by a Chicago broker for water shipment in the spring. This action would indicate at least one important buyer foresees a continuing strong market.

St. Louis

Following the sale of 8000 to 10,000 tons of No. 2 steel to an East Side mill, plus the prospects of other pending deals being closed, prices were advanced from 50c. to \$1.50 a ton by dealers in the St. Louis market. No railroad lists are pending, and dealers say that offerings from the country are drying up and that even higher prices may be expected.

Cincinnati

Activity in other districts has strengthened the undertone here despite a lack of substantial ordering. Movement on contract is improving as mill activity increases. Sales of foundry grades are reported, but mill buying is slow.

Superior Steel Corp., Pittsburgh, had a net income for the year of \$454,943 after Federal and State income taxes, interest, depreciation and other charges, equivalent to \$3.98 a share on 114,276 shares of \$100 par capital stock, excluding 724 shares held in the treasury. In 1935 the net income amounted to \$46,691, or 41c. a share on 113,576 common shares then outstanding. No provision was made for Federal surtax on undivided income, as opinion was expressed that the company would not be liable.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$19.50 to \$20.00
Railroad hvy. mltng.	20.50 to 21.00
No. 2 hvy. mltng. steel.	17.75 to 18.25
No. 2 RR. wrought	19.50 to 20.00
Scrap rails	20.50 to 21.00
Rails, 3 ft. and under.	22.50 to 23.00
Comp. sheet steel	19.50 to 20.00
Hand. bundled sheets.	18.50 to 19.00
Hvy. steel axle turn.	18.00 to 18.50
Machine shop turn.	14.00 to 14.50
Short shov. turn.	14.50 to 15.00
Mixed bor. & turn.	13.50 to 14.00
Cast iron borings	14.00 to 14.50
Cast iron carwheels	18.50 to 19.00
Hvy. breakable cast.	15.50 to 16.00
No. 1 cast	17.50 to 18.00
RR. knuckles & cplrs.	25.50 to 26.00
Rail coil & leaf springs	25.50 to 26.00
Rolled steel wheels	25.50 to 26.00
Low phos. billet crops.	25.50 to 26.00
Low phos. sh. bar.	25.00 to 25.50
Low phos. punchings.	24.00 to 24.50
Low phos. plate scrap.	24.50 to 25.00
Steel car axles	24.00 to 24.50

CLEVELAND

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$17.50 to \$17.75
No. 2 hvy. mltng. steel.	16.50 to 16.75
Comp. sheet steel	16.75 to 17.25
Light bund. stampings	13.00 to 13.50
Drop forge flashings	16.25 to 16.75
Machine shop turn.	12.00 to 12.50
Short shov. turn.	12.00 to 12.50
No. 1 busheling	16.00 to 16.50
Steel axle turnings	15.00 to 15.50
Low phos. billet crops	22.00 to 22.50
Cast iron borings	12.75 to 13.25
Mixed bor. & turn.	12.75 to 13.25
No. 2 busheling	12.75 to 13.25
No. 1 cast	19.50 to 20.00
Railroad grate bars	12.00 to 12.50
Stove plate	10.00 to 10.50
Rails under 3 ft.	22.00 to 22.50
Rails for rolling	21.50 to 22.00
Railroad malleable	18.00 to 18.50
Cast iron carwheels	18.50 to 19.00

PHILADELPHIA

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$18.50
No. 2 hvy. mltng. steel.	\$17.50 to 18.00
Hydraulic bund., new.	18.00 to 18.50
Hydraulic bund., old.	16.00 to 16.50
Steel rails for rolling	18.50 to 19.00
Cast iron carwheels	18.50 to 19.00
Hvy. breakable cast	18.00
No. 1 cast	19.00 to 19.50
Stove plate (steel wks.)	14.50 to 15.00
Railroad malleable	18.00 to 18.50
Machine shop turn.	12.50 to 13.00
No. 1 blast furnace	11.00 to 11.50
Cast borings	11.00 to 11.50
Heavy axle turnings	16.50 to 17.00
No. 1 low phos. hvy.	22.50 to 23.00
Couplers & knuckles	23.50 to 24.00
Rolled steel wheels	23.50 to 24.00
Steel axles	23.00 to 23.50
Shafting	22.50 to 23.00
No. 1 RR. wrought	17.00 to 17.50
Spec. iron & steel pipe	15.50 to 16.00
No. 1 forge fire	16.50 to 17.00
Cast borings (chem.)	12.00 to 13.00

CHICAGO

Delivered to Chicago district consumers:	
Per Gross Ton	
Hvy. mltng. steel	\$19.50 to \$20.00
Auto. hvy. mltng. steel.	17.75 to 18.25
Alloy free	18.00 to 18.50
Shoveling steel	19.50 to 20.00
Hydraul. comp. sheets.	18.25 to 18.75
Drop forge flashings	16.00 to 16.50
No. 1 busheling	17.75 to 18.25
Rolled carwheels	21.50 to 22.00
Railroad tires, cut	21.75 to 22.25
Railroad leaf springs	21.50 to 22.00
Axle turnings	18.00 to 18.50
Steel coup. & knuckles	21.50 to 22.00
Coil springs	23.00 to 23.50
Axle turn. (elec.)	18.75 to 19.25
Low phos. punchings	22.00 to 22.50
Low phos. plates, 12 in. and under	22.00 to 22.50
Cast iron borings	11.25 to 11.75
Short shov. turnings	12.00 to 12.50
Machine shop turn.	10.25 to 10.75
Rerolling rails	21.00 to 21.50
Steel rails under 3 ft.	21.75 to 22.25
Steel rails under 2 ft.	22.50 to 23.00
Angle bars, steel	20.75 to 21.25
Cast iron carwheels	18.75 to 19.25
Railroad malleable	20.75 to 21.25
Agric. malleable	18.00 to 18.50
Per Net Ton	
Iron car axles	25.00 to 25.50

Steel car axles	\$22.00 to \$22.50
No. 1 RR. wrought	17.50 to 18.00
No. 2 RR. wrought	17.50 to 18.00
No. 2 busheling, old.	9.00 to 9.50
Locomotive tires	18.50 to 19.00
Pipes and flues	14.00 to 14.50
No. 1 machinery cast.	16.00 to 16.50
Clean auto. cast	15.00 to 15.50
No. 1 railroad cast	15.00 to 15.50
No. 1 agric. cast	13.00 to 13.50
Stove plate	11.50 to 12.00
Grate bars	12.50 to 13.00
Brake shoes	12.50 to 13.00

BUFFALO

Per gross ton, f.o.b. consumers' plants:	
No. 1 hvy. mltng. steel.	\$18.50 to \$19.00
No. 2 hvy. mltng. steel.	17.00 to 17.50
Scrap rails	17.50 to 18.00
New hy. b'ndled sheet	17.00 to 17.50
Old hydraul. bundles	14.50 to 15.00
Drop forge flashings	17.00 to 17.50
No. 1 busheling	17.00 to 17.50
Hvy. axle turnings	11.00 to 11.50
Machine shop turn	12.50 to 12.75
Knuckles & couplers	21.00 to 21.50
Coil & leaf springs	21.00 to 21.50
Rolled steel wheels	21.00 to 21.50
Low phos. billet crops.	21.50 to 22.00
Shov. turnings	12.25 to 12.75
Mixed bor. & turn.	11.75 to 12.25
Cast iron borings	11.75 to 12.25
Steel car axles	20.50 to 21.00
No. 1 machinery cast.	18.00 to 18.50
No. 1 cupola cast	16.25 to 16.75
Stove plate	13.00 to 13.50
Steel rails under 3 ft.	21.50 to 22.00
Cast iron carwheels	16.00 to 16.50
Railroad malleable	18.50 to 17.50
Chemical borings	13.00 to 13.50

BIRMINGHAM

Per gross ton delivered to consumer:	
Hvy. melting steel	\$12.50 to \$13.00
Scrap steel rails	12.50 to 13.00
Short shov. turnings	8.00
Stove plate	8.50
Steel axles	15.00
Iron axles	15.00
No. 1 RR. wrought	10.00
Rails for rolling	14.00
No. 1 cast	13.50
Tramcar wheels	13.00

ST. LOUIS

Dealer's buying prices per gross ton delivered to consumer:	
Selected hvy. steel	\$17.50 to \$18.00
No. 1 hvy. melting	17.00 to 17.50
No. 2 hvy. melting	15.00 to 15.50
No. 1 locomotive tires	18.00 to 18.50
Misc. stand.-sec. rails	17.50 to 18.50
Railroad springs	19.50 to 20.00
Bundled sheets	11.00 to 11.50
No. 2 RR. wrought	17.00 to 17.50
No. 1 busheling	14.00 to 14.50
Cast bor. & turn.	5.50 to 6.00
Rails for rolling	18.00 to 18.50
Machine shop turn.	7.50 to 8.00
Heavy turnings	12.50 to 13.00
Steel car axles	21.00 to 21.50
Iron car axles	22.00 to 22.25
No. 1 RR. wrought	14.00 to 14.50
Steel rails under 3 ft.	17.50 to 18.00
Steel angle bars	18.00 to 18.50
Cast iron carwheels	16.50 to 17.00
No. 1 machinery cast.	13.00 to 13.50
Railroad malleable	17.50 to 18.00
No. 1 railroad cast.	13.25 to 13.75
Stove plate	11.25 to 11.75
Agricul. malleable	12.50 to 13.00
Grate bars	11.50 to 12.00
Brake shoes	13.00 to 13.50

CINCINNATI

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel.	\$16.00 to \$17.00
No. 2 hvy. mltng. steel.	13.75 to 14.25
Scrap rails for mltng.	16.50 to 17.00
Loose sheet clippings	10.50 to 11.00
Bundled sheets	11.50 to 12.00
Cast iron borings	8.50 to 9.00
Machine shop turns	9.50 to 10.00
No. 1 busheling	13.00 to 13.50
No. 2 busheling	8.00 to 8.50
Rails for rolling	17.00 to 17.50
No. 1 locomotive tires	14.25 to 14.75
Short rails	20.00 to 20.50
Cast iron carwheels	15.50 to 16.00
No. 1 machinery cast	16.25 to 16.75
No. 1 railroad cast	15.25 to 15.75
Burnt cast	11.25 to 11.75
Stove plate	11.25 to 11.75
Agricul. malleable	15.50 to 16.00
Railroad malleable	17.00 to 17.50

DETROIT

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel.	\$15.00 to \$15.50
No. 2 hvy. mltng. steel.	14.25 to 14.75
Borings and turnings	11.50 to 12.00
Long turnings	11.00 to 11.50
Short shov. turnings	11.75 to 12.25
No. 1 machinery cast.	15.00 to 15.50
Automotive cast	16.25 to 16.75
Hydraul. comp. sheets.	16.25 to 16.75
Stove plate	9.25 to 9.75
New factory bushel	15.00 to 15.50
Old No. 2 busheling	9.75 to 10.25
Sheet clippings	12.00 to 12.50
Flashings	14.50 to 15.00
Low phos. plate scrap.	17.00 to 17.50

YOUNGSTOWN

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$19.00 to \$19.50
Hydraulic bundles	18.50 to 19.00
Machine shop turn.	14.50 to 15.00

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel.	\$14.00 to \$15.00
No. 2 hvy. mltng. steel.	13.00 to 14.00
Hvy. breakable cast.	13.50 to 14.00
No. 1 machinery cast.	15.00 to 15.50
No. 2 cast	12.00 to 12.50
Stove plate	10.50 to 11.00
Steel car axles	22.00 to 23.00
Shafting	19.00 to 20.00
No. 1 RR. wrought	13.50 to 14.00
No. 1 wrought long.	12.50 to 13.00
Spec. iron & steel pipe	12.00 to 12.50
Rails for rolling	15.50 to 16.00
Clean steel turnings	8.25 to 8.75
Cast borings	8.50 to 8.75
No. 1 blast furnace	7.75 to 8.00
Cast borings (chem.)	11.00 to 11.50
Unprepar. yard scrap.	8.50 to 9.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast.	\$16.00 to \$16.50
No. 1 hvy. cast cupola.	12.50 to 13.00
No. 2 cast	11.50 to 12.00
Add 25c. to 50c. to above quotations to secure North Jersey prices.	

BOSTON

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel.	\$13.80 to \$14.30
Scrap rails	13.80 to 14.30
No. 2 steel	12.05 to 12.25
Breakable cast	13.00
Machine shop turn.	8.50 to 8.55
Unmixed bor. & turn.	7.00 to 8.25
Bund. skeleton long.	12.25 to 12.30
Shafting	16.75 to 17.00
Cast bor. chemical.	7.00 to 8.75
Per gross ton delivered consumers' yards:	
Textile cast	\$13.25 to \$16.50
No. 1 machine cast	13.75 to 15.50
Stove plate	10.00 to 10.50

EXPORT

Dealers' buying prices per gross ton:	
New York, delivered alongside barges	
No. 1 hvy. mltng. steel.	\$14.00
No. 2 hvy. mltng. steel.	13.00
No. 2 cast	12.00
Stove plate	\$10.50 to 11.00

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel.	\$16.25 to \$16.50
No. 2 hvy. mltng. steel.	15.25 to 15.50
Rails (scrap)	16.50
Stove plate	\$7.75 to 8.00

Philadelphia, delivered alongside boats, Port Richmond

No. 1 hvy. mltng. steel.	\$18.00
No. 2 hvy. mltng. steel.	17.00

New Orleans, on cars at Stuyvesant Dock

No. 1 hvy. mltng. steel.	\$14.25
No. 2 hvy. mltng. steel.	13.25

Los Angeles, on cars or trucks at local piers

No. 1 hvy. mltng. steel.	\$10.50 to \$11.00
Compressed bundles	8.50 to 9.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are \$2 a ton higher, and delivered Detroit \$3 higher.

Per Gross Lb.
Rerolling\$34.00
Forging quality 40.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton
Open-hearth or Besse-mer\$34.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.
Grooved, universal and sheared1.80c.

Wire Rods

(No. 5 to 15/32 in.)

Per Gross Ton
F.o.b. Pittsburgh or Cleveland.....\$43.00
F.o.b. Chicago, Youngstown or Anderson, Ind. 44.00
F.o.b. Worcester, Mass. 45.00
F.o.b. Birmingham 46.00
F.o.b. San Francisco 52.00
F.o.b. Galveston 49.00

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

Base per Lb.
F.o.b. Pittsburgh 2.20c.
F.o.b. Chicago or Gary 2.25c.
F.o.b. Duluth 2.35c.
Del'd Detroit 2.35c.
F.o.b. Cleveland 2.25c.
F.o.b. Buffalo 2.30c.
Del'd Philadelphia 2.51c.
Del'd New York 2.55c.
F.o.b. Birmingham 2.35c.
F.o.b. cars dock Gulf ports... 2.60c.
F.o.b. cars dock Pacific ports... 2.75c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh 2.05c.
F.o.b. Cleveland, Chicago, Gary or Moline, Ill. 2.10c.
F.o.b. Buffalo 2.15c.
F.o.b. Birmingham 2.20c.
F.o.b. cars dock Gulf ports... 2.45c.
F.o.b. cars dock Pacific ports... 2.60c.

Billet Steel Reinforcing
(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh 2.25c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham 2.30c.
Del'd Detroit 2.40c.
F.o.b. cars dock Gulf ports... 2.65c.
F.o.b. cars dock Pacific ports... 2.65c.

Rail Steel Reinforcing
(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh 2.10c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham 2.15c.
F.o.b. cars dock Gulf ports... 2.50c.
F.o.b. cars dock Pacific ports... 2.50c.

Iron

F.o.b. Chicago 2.15c.
F.o.b. Pittsburgh (refined) 3.25c.

Cold Finished Bars and Shafting*

Base per Lb.
F.o.b. Pittsburgh 2.55c.
F.o.b. Cleveland, Chicago and Gary 2.60c.
F.o.b. Buffalo 2.65c.
Del'd Detroit 2.70c.
Del'd eastern Michigan 2.75c.

* In quantities of 10,000 to 19,999 lb.

Plates

Base per Lb.
F.o.b. Pittsburgh 2.05c.
F.o.b. Chicago or Gary 2.10c.
Del'd Cleveland 2.235c.
F.o.b. Coatesville or Spar. Pt. 2.15c.
Del'd Philadelphia 2.235c.
Del'd New York 2.33c.
F.o.b. Birmingham 2.20c.
F.o.b. cars dock Gulf ports... 2.45c.

F.o.b. cars dock Pacific ports.. 2.60c.
Wrought iron plates, f.o.b. Pittsburgh 3.20c.

Floor Plates

F.o.b. Pittsburgh 3.60c.
F.o.b. Chicago 3.65c.
F.o.b. Coatesville 3.70c.
F.o.b. cars dock Gulf ports... 4.00c.
F.o.b. cars dock Pacific ports.. 4.15c.

Structural Shapes

Base per Lb.
F.o.b. Pittsburgh 2.05c.
F.o.b. Chicago 2.10c.
Del'd Cleveland 2.235c.
F.o.b. Buffalo or Bethlehem.. 2.15c.
Del'd Philadelphia 2.255c.
Del'd New York 2.305c.
F.o.b. Birmingham (standard) 2.20c.
F.o.b. cars dock Gulf ports... 2.45c.
F.o.b. cars dock Pacific ports.. 2.60c.

Steel Sheet Piling

Base per Lb.
F.o.b. Pittsburgh 2.40c.
F.o.b. Chicago or Buffalo 2.50c.
F.o.b. cars dock Gulf or Pacific Coast ports 2.85c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton\$39.00
Angle bars, per 100 lb. 2.55c. to 2.70c.

F.o.b. Basing Points

Light rails (from billets) per gross ton\$38.00
Light rails (from rail steel) per gross ton 37.00

Base per Lb.
Spikes 2.90c.
Tie plates, steel 2.10c.
Tie plates, Pacific Coast ports.. 2.20c.
Track bolts, to steam railroads. 4.00c.
Track bolts, to jobbers, all sizes (per 100 counts)

65-5-5 per cent off list
Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE,

TERNE PLATE

Sheets

Hot Rolled

Base per Lb.
No. 10, f.o.b. Pittsburgh 2.15c.
No. 10, f.o.b. Gary 2.25c.
No. 10, del'd Detroit 2.35c.
No. 10, del'd Philadelphia 2.46c.
No. 10, f.o.b. Birmingham 2.30c.
No. 10, f.o.b. cars dock Pacific ports 2.70c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh 2.80c.
No. 24, f.o.b. Gary 2.90c.
No. 24, del'd Detroit 3.00c.
No. 24, del'd Philadelphia 3.11c.
No. 24, f.o.b. Birmingham 2.95c.
No. 24, f.o.b. cars dock Pacific ports 3.45c.
No. 24, wrought iron, Pittsburgh 4.50c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh.. 2.80c.
No. 10 gage, f.o.b. Gary 2.90c.
No. 10 gage, f.o.b. Detroit 3.00c.
No. 10 gage, del'd Philadelphia. 3.11c.
No. 10 gage, f.o.b. Birmingham. 2.95c.
No. 10 gage, f.o.b. cars dock Pacific ports 3.40c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh.. 3.25c.
No. 20 gage, f.o.b. Gary 3.35c.
No. 20 gage, del'd Detroit 3.45c.
No. 20 gage, del'd Philadelphia. 3.56c.
No. 20 gage, f.o.b. Birmingham. 3.40c.
No. 20 f.o.b. cars dock Pacific ports 3.80c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh.. 3.40c.
No. 24, f.o.b. Gary 3.50c.
No. 24, del'd Philadelphia 3.71c.
No. 24, f.o.b. Birmingham 3.55c.
No. 24, f.o.b. cars dock Pacific ports 4.00c.
No. 24, wrought iron, Pittsburgh 5.15c.

Electrical Sheets (F.o.b. Pittsburgh)

Base per Lb.
Field grade 3.20c.
Armature 3.55c.
Electrical 4.05c.
Special Motor 5.10c.
Special Dynamo 5.80c.
Transformer 6.30c.
Transformer Special 7.30c.
Transformer Extra Special 7.80c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 25c. per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh 3.70c.
F.o.b. Gary 3.80c.
F.o.b. cars dock Pacific ports.. 4.40c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh 3.20c.
No. 20, f.o.b. Gary 3.30c.
No. 20, f.o.b. Birmingham 3.80c.
No. 20, f.o.b. cars dock Pacific ports 3.80c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh 2.95c.
No. 28, Gary 3.05c.
No. 28, cars dock Pacific ports, boxed 3.825c.

Tin Plate

Base per Box
Standard cokes, f.o.b. Pittsburgh district mill\$4.85
Standard cokes, f.o.b. Gary 4.95

Above quotations practically the equivalent of previous quotations owing to new method of quoting, effective Jan. 1, 1937.

Special Coated Manufacturing Ternes Manufacturing Ternes

Per Base Box
F.o.b. Pittsburgh*\$4.15
F.o.b. Gary* 4.25

* Customary 7½ per cent discount in effect through 1936 discontinued as of Jan. 1, 1937.

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.\$10.00
15-lb. coating I.C. 12.00
20-lb. coating I.C. 13.00
25-lb. coating I.C. 14.00
30-lb. coating I.C. 15.25
40-lb. coating I.C. 17.50

Hot-Rolled Hoops, Bands, Strip and Flats under ¼ in.

Base per Lb.
All widths up to 24 in., Pittsburgh 2.15c.
All widths up to 24 in., Chicago 2.25c.
All widths up to 24 in., del'd Detroit 2.35c.
All widths up to 24 in., Birmingham 2.30c.
Cooperage stock, Pittsburgh.. 2.25c.
Cooperage stock, Chicago 2.35c.

Cold-Rolled Strip*

Base per Lb.
F.o.b. Pittsburgh 2.85c.
F.o.b. Cleveland 2.85c.
Del'd Chicago 3.13c.
F.o.b. Worcester 3.05c.

* Carbon 0.25 and less.

Cold Rolled Spring Steel

Pittsburgh and Cleveland Worcester
Carbon 0.25-0.50% 2.85c. 3.05c.
Carbon .51-.75 3.95c. 4.15c.
Carbon .76-1.00 5.70c. 5.90c.
Carbon Over 1.00 7.75c. 7.95c.

Fender Stock

No. 14, Pittsb'gh or Cleveland 3.10c.
No. 14, Worcester 3.50c.
No. 20, Pittsb'gh or Cleveland. 3.50c.
No. 20, Worcester 3.90c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Spring wire	3.20c.

Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.

To the Trade

	Base per Keg
Standard wire nails	\$2.25
Smooth coated nails	2.25

	Base per 100 Lb.
Annealed fence wire	\$2.90
Galvanized fence wire	3.30
Polished staples	2.95
Galvanized staples	3.20
Barbed wire, galvanized	2.75
Twisted barless wire	2.75
Woven wire fence, base column	63.00
Single loop bale ties, base column	55.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., mill prices are \$2 a ton over Pittsburgh except for woven wire fence, which is \$3 over Pittsburgh and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of \$6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

In.	Black Galv.	In.	Black Galv.
1/4	57 37	1/4 & 3/8	+6 +26
1/2	60 44 1/2	1/2	27 10 1/2
3/4	64 1/2 55	3/4	32 16
1	67 1/2 59	1 & 1 1/4	35 21
1 to 3...	69 1/2 61 1/2	1 1/2	39 23 1/2
		2	38 1/2 23

Lap Weld

In.	Black Galv.	In.	Black Galv.
2	62 53 1/2	2	32 1/2 18
2 1/2	3.65 56 1/2	2 1/2 to 3 1/2	33 1/2 20 1/2
3 1/2	6.67 58 1/2	4 to 8...	35 1/2 24
7 & 8...	66 1/2 56 1/2	9 to 12...	23 1/2 15
9 & 10...	65 1/2 56		
11 & 12...	64 1/2 55		

In.	Black Galv.	In.	Black Galv.
1/4	55 1/2 42 1/2	1/4 & 3/8	+7 +39
1/2	57 1/2 46 1/2	1/2	28 13
3/4	62 1/2 54 1/2	3/4	33 18
1	66 1/2 58 1/2	1 to 2...	39 24 1/2
1 to 3...	68 61		

In.	Black Galv.	In.	Black Galv.
2	60 52 1/2	2	35 1/2 21 1/2
2 1/2	3.64 56 1/2	2 1/2	4.41 28 1/2
3 1/2	6.67 60	4 1/2	6.40 28
7 & 8...	66 1/2 57	7 & 8...	41 1/2 28 1/2
9 & 10...	65 1/2 56	9 to 12...	32 20 1/2
11 & 12...	64 1/2 55		

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

In.	o.d.	13 B.W.G.	Cold Drawn	Hot Rolled
1	13 B.W.G.	\$ 8.60	\$ 7.82	
1 1/4	13 B.W.G.	10.19	9.26	
1 1/2	13 B.W.G.	11.26	10.33	
1 3/4	13 B.W.G.	12.81	11.64	
2	13 B.W.G.	14.35	13.04	
2 1/4	13 B.W.G.	16.00	14.54	
2 1/2	12 B.W.G.	17.61	16.01	
2 3/4	12 B.W.G.	19.29	17.54	
3	12 B.W.G.	20.45	18.59	

3 in. o.d.	12 B.W.G.	\$21.45	\$19.50
4 1/4 in. o.d.	10 B.W.G.	41.08	37.35
3 1/2 in. o.d.	11 B.W.G.	27.09	24.62
4 in. o.d.	10 B.W.G.	33.60	30.54
4 1/2 in. o.d.	10 B.W.G.	41.08	37.35
5 in. o.d.	9 B.W.G.	51.56	46.87
6 in. o.d.	7 B.W.G.	79.15	71.90

	Extra for less-carload quantities:
25,000 lb. or ft.	to 39,999 lb. or ft. 5 %
12,000 lb. or ft.	to 24,999 lb. or ft. 12 1/2 %
6,000 lb. or ft.	to 11,999 lb. or ft. 25 %
2,000 lb. or ft.	to 5,999 lb. or ft. 35 %
Under 2,000 lb. or ft.	50 %

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago	\$50.00
6-in. and larger, del'd New York	48.00
*6-in. and larger, Birmingham	42.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	50.50
F.o.b. dock, Seattle	50.50
4-in., f.o.b. dock, San Francisco or Los Angeles	53.50
F.o.b. dock, Seattle	53.50

Class "A" and gas pipe, \$3 extra.
4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$41. Birmingham, and \$49.50, delivered Chicago; and 4-in. pipe, \$44, Birmingham, and \$52.40 a ton, delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:	
1/2 in. x 6 in. and smaller	70
Larger than 1/2 in.	65 and 10
Lag bolts	65 and 10
Plow bolts, Nos. 1, 2, 3, and 7 heads	65, 10 and 10
Hot-pressed nuts, blank or tapped, square	65 and 10
Hot-pressed nuts, blank or tapped, hexagon	65 and 10
C.p.c. and t. square or hex. nuts, blank or tapped	65 and 10
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes	60, 20 and 5

Stove bolts in packages, nuts attached	72 1/2
Stove bolts in packages, with nuts separate	72 1/2 and 5
Stove bolts in bulk	81 1/2

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(1/2-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland	\$3.25
F.o.b. Chicago or Birmingham	3.35

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh	70 and 5
F.o.b. Cleveland	70 and 5
F.o.b. Chicago and Birm'g'm	70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lbs. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller	50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread 3/4 in. and smaller	75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller	60
Upset set screws, cup and oval points	75
Milled studs	65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs
F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.

Base price, \$55 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	2.75c.
Delivered, Detroit	2.90c.

S.A.E. Alloy Series Differential Numbers per 100 lb.

2000 (1/2% Nickel)	\$0.25
2100 (1 1/2% Nickel)	0.55
2300 (3 1/2% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30) Molybdenum (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.10c.
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.40
Carbon Vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric turned steel is 50c. higher. The differential for cold-drawn bars 1/2c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.25c. base per lb. Delivered Detroit, 3.40c.

STAINLESS STEEL No. 302

(17 to 19% Cr, 7 to 9% Ni, 0.08 to 0.20% C.)

(Base Prices f.o.b. Pittsburgh)

	Per Lb.
Forging billets	19.55c.
Bars	23c.
Plates	26c.
Structural shapes	23c.
Sheets	33c.
Hot-rolled strip	20 3/4 c.
Cold-rolled strip	27c.
Drawn wire	23c.

TOOL TEEL

Base Per Lb.

High speed	60c.
High carbon chrome	39c.
Oil hardening	22c.
Special	20c.
Extra	16 1/2 c.
Regular	13c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental

BRITISH

Per Gross Ton

f.o.b. United Kingdom Ports

Ferromanganese, export	£9
Billets, open-hearth	£6 to £6 5s.
Tin plate, per base box	£1 11s. 6d.

Steel bars, open-hearth	£3 10s.
Beams, open-hearth	£3 5s.
Channels, open-hearth	£3 10s.
Angles, open-hearth	£3 5s.
Black sheets, No. 24 gage	£12 7 1/2 s.
Galvanized sheets, No. 24 gage	£14 17 1/2 s.

CONTINENTAL

Per Metric Ton, Gold £

f.o.b. Continental Ports

Current dollar equivalent is ascertained by multiplying gold pound prices by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas	£3 4s. 6d.
Wire rods, No. 5 B.W.G.	£4 10s.
Steel bars, merchant	£3 15s. 6d.
Sheet bars	£2 15s. 6d.
Plate, 1/4 in. and up	£6 14s.
Plate, 3/16 in. and 5 mm.	£5
Sheet, 1/4 in.	£6 5s.
Beams, Thomas	£3 2s. 6d.
Angles (Basic)	£3 2s. 6d.
Hoops and strip, base	£4
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4 pt. No. 10 B.W.G.	£8 15s.

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH

	Base per Lb.
Plates	3.40c.
Structural shapes	2.40c.
Soft steel bars and small shapes	3.30c.
Reinforcing steel bars	3.30c.
Cold-finished and screw stock:	
Rounds and hexagons	3.80c.
Squares and flats	3.80c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	3.50c.
Hoops	4.00c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.65c.
Galv. sheets (No. 24), 25 or more bundles	4.25c.
Hot-rolled sheets (No. 10)	3.25c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$3.94
Spikes, large	3.25c.

Per Cent Off List

Track bolts, all sizes, per 100 count	60
Machine bolts, 100 count	65-5
Carriage bolts, 100 count	65-5
Nuts, all styles, 100 count	65-5
Large rivets, base per 100 lb.	\$3.75
Wire, black, soft ann'l'd, base per 100 lb.	3.15c.
Wire, galv. soft, base per 100 lb.	3.55c.
Common wire nails, per keg	2.50c.
Cement coated nails, per keg	2.50c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.45c.
Soft steel bars, rounds	3.35c.
Soft steel bars, squares and hexagons	3.50c.
Cold-fin. steel bars:	
Rounds and hexagons	3.95c.
Flats and squares	3.95c.
Hot-rolled strip	3.60c.
Hot-rolled annealed sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.65c.
Spikes (keg lots)	4.00c.
Track bolts (keg lots)	5.10c.
Rivets, structural (keg lots)	4.10c.
Rivets, boiler (keg lots)	4.10c.

Per Cent Off List

Machine bolts	*65
Carriage bolts	*65
Lag screws	*65
Hot-pressed nuts, sq. tap or blank	*65
Hot-pressed nuts, hex. tap or blank	*65
Hex. head cap screws	60
Cut point set screws	75 and 10
Flat head bright wood screws	62 and 20
Spring cotters	55
Stove bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	\$4.00 off list
Black ann'l'd wire per 100 lb.	\$4.05
Com. wire nails, 15 kegs or more	2.70c.
Cement c't'd nails, 15 kegs or more	2.70c.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	3.65c.
Structural shapes	3.62c.
Soft steel bars, rounds	3.62c.
Iron bars, Swed. charcoal	6.75c. to 7.00c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.22c.
Flats and squares	4.22c.
Cold-rolled: strip, soft and quarter hard	3.57c.

Hoops	3.82c.
Bands	3.82c.
Hot-rolled sheets (No. 10)	3.57c.
Hot-rolled ann'l'd sheets (No. 24*)	4.22c.
Galvanized sheets (No. 24*)	4.82c.
Long terme sheets (No. 24)	5.55c.
Armco iron, galv. (No. 24†)	5.85c.
Toncan iron, galv. (No. 24†)	3.85c.
Galvannealed (No. 24†)	5.95c.
Armco iron, hot-rolled annealed (No. 24†)	5.30c.
Toncan iron, hot-rolled annealed (No. 24†)	5.30c.
Armco iron hot-rolled (No. 10†)	4.35c.
Toncan iron, hot-rolled (No. 10†)	4.35c.
Cold-rolled sheets (No. 20) less than 1000 lbs.	

Standard quality	4.85c.
Deep drawing	5.50c.
Stretcher leveled	5.50c.
SAE, 2300, hot-rolled	7.32c.
SAE, 3100, hot-rolled	5.72c.
SAE, 6100 hot-rolled, annealed	9.92c.
SAE, 2300, cold-rolled	3.30c.
SAE, 3100, cold-rolled, annealed	7.75c.
Floor plate, ½ in. and heavier	5.45c.
Standard tool steel	11.75c.
Wire, black, annealed (No. 9)	3.60c.
Wire, galv. (No. 9)	3.85c.
Tire steel, 1 x ½ in. and larger	4.11c.
Open-hearth spring steel	4.15c. to 10.15c.
Common wire nails, base per keg	\$3.70

Per Cent Off List

Machine bolts, square head and nut:	
All diameters	65
Carriage bolts, cut thread:	
All diameters	65
* No. 28 and lighter, 36 in. wide.	
20c. higher per 100 lb.	
† 125 lb. and more.	

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.69c.
Bars, soft steel (rounds and flats)	3.59c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	3.74c.
Cold-fin. rounds, shafting, screw stock	4.19c.
Hot-rolled annealed sheets (No. 24)	4.29c.
Galv. sheets (No. 24)	4.89c.
Hot-rolled sheets (No. 10)	3.59c.
Black corrug. sheets (No. 24)	4.29c.
½ Galv. corrug. sheets	4.89c.
Structural rivets	4.44c.
Boiler rivets	4.44c.

Per Cent Off List

Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities	65
*No. 26 and lighter take special prices.	

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	3.30c.
*Structural shapes	3.30c.
*Soft steel bars, small shapes, iron bars (except bands)	3.45c.
†Reinforc. steel bars, sq. twisted and deformed	3.21c.
Cold-finished steel bars	4.18c.
*Steel hoops	3.80c.
*Steel bands, No. 12 and 3/16 in. incl.	3.55c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	4.15c.
†Galvanized sheets (No. 24)	4.80c.
*Hot-rolled annealed sheets (No. 10)	3.40c.
Diam. pat. floor plates, ¼ in.	5.25c.
Swedish iron bars	6.25c.

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.56c.
Soft steel bars	3.25c.
†Reinforc. steel bars	2.25c.
†Cold-finished steel bars	3.95c.
Flat-rolled steel under ¼ in.	3.66c.
Cold-finished strip	3.25c.
Hot-rolled annealed sheets (No. 24)	4.31c.
Galvanized sheets (No. 24)	4.91c.
Hot-rolled sheets (No. 10)	3.41c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.66c.
*Black ann'l'd wire, per 100 lb.	\$3.10
*No. 9 galv. wire, per 100 lb.	3.50
*Com. wire nails, base per keg	2.45c.

Per Cent Off List

Machine and carriage bolts, small	.70
Large	.65 and 10
Nuts, 100 count	.65
†Outside delivery 10c. less.	
*For 5000 lb. or less.	
† Plus switching and cartage charges and quantity differentials up to 50c.	

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.65c.
Floor plates	5.40c.
Bars, rounds, flats and angles	3.55c.
Other shapes	3.70c.
Rail steel reinforc. bars	3.40c.
Hoops and bands, 3/16 in. and lighter	3.75c.
Cold-finished bars	4.15c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.05c.
Galv. sheets (No. 24) 3750 lb. or more	4.07c.
Galvanized sheets (No. 24) over 3500 lb.	4.65c.
Hot-rolled sheets (No. 10)	3.50c.
Small rivets	.55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	\$2.88
Com. wire nails, base per keg: Any quantity less than carload	3.04
Cement c't'd nails, base 100-lb keg	3.50
Chain, lin. per 100 lb.	8.35

Net per 100 Ft.

Seamless steel boiler tubes,	
2-in.	\$20.37
4-in.	48.14
Lap-welded steel boiler tubes,	
2-in.	19.38
4-in.	45.32

BUFFALO

	Base per Lb.
Plates	3.62c.
Struc. shapes	3.50c.
Soft steel bars	3.40c.
Reinforcing bars	2.75c.
Cold-fin. flats and sq.	4.00c.
Rounds and hex.	4.00c.
Cold-rolled strip steel	3.44c.
Hot-rolled annealed sheets (No. 24)	4.46c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.72c.
Galv. sheet (No. 24)	5.00c.
Bands	3.72c.
Hoops	3.72c.
Heavy top-rolled sheets	3.47c.
Com. wire nails, base per keg \$3.00	
Black wire, base per 100 lb. (2500-lb. lots or under)	4.10c.
(Over 2500 lb.)	4.00c.

BOSTON

	Base per Lb.
Channels, angles	3.75c.
Tees and zeos, under 3"	4.00c.
H beams and shapes	3.77c.
Plates—Sheared, tank, and univ. mill, ¼ in. thick and heavier	3.78c.
Floor plates, diamond pattern (mild steel)	3.75c.
Bar and bar shapes (mild steel)	3.75c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.90c. to 4.90c.
Half rounds, half ovals, ovals and bevels	5.00c.
Tire steel	5.00c.
Cold-rolled strip steel	3.495c.
Cold-finished rounds, squares and hexagons	4.30c.
Cold-finished flats	4.30c.
Blue annealed sheets, No. 10 ga.	3.90c.
One pass cold-rolled sheets No. 24 ga.	4.50c.
Galvanized steel sheets, No. 24 ga.	4.55c.
Lead coated sheets, No. 24 ga.	6.15c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

Base per Lb.

Soft steel bars	3.44c.
Structural shapes	3.65c.
Plates	3.65c.
Floor plates	5.40c.
Hot-rolled annealed sheets (No. 24)*	4.34c.
Hot-rolled sheets (No. 10)	3.44c.
Galvanized sheets (No. 24)**	5.00c.
Bands and hoops	3.69c.
†Cold-finished bars	4.04c.
Cold-rolled strip	3.43c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	5.79c.
Bolts and nuts, in cases, 65 per cent off list	
Broken cases	60 per cent off
Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.	
* Under 400 lb., .50c. over base; 400 to 3499 lb., base; 3500 lb. and over, base less .25c.	
** Under 400 lb., .50c. over base; 400 to 1499 lb., base; 1500 to 3749 lb., base less .20c.; 3750 to 7499 lb., less .40c.; 7500 lb. and over, less .60c.	

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Common wire nails, base per keg
Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

Base per Lb.

Plates and structural shapes	3.56c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.46c.
Soft steel bars, squares and hexagons	3.61c.
Hot-rolled strip	3.71c.
Hot-rolled annealed sheets (No. 24)	4.16c.
Galvanized sheets (No. 24)	4.76c.
Cold-finished steel bars	4.06c.
Structural rivets (keg lots)	4.21c.
Boiler rivets, cone head (keg lots)	4.21c.
Track spikes (keg lots)	4.11c.
Track bolts (keg lots)	5.21c.
Black annealed wire (No. 14 and heavier)	4.16c.
Com. wire nails and cement coated nails	
15 kegs and over	2.81c.
Per Cent Off List	
Machine bolts and carriage bolts, 1/2x6 and smaller	.65
Larger	.65
Coach and lag screws	.65
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	.65

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

Base per Lb.

Mild steel bars, rounds	3.60c.
Structural shapes	3.70c.
Plates	3.70c.
Cold-finished bars	4.42c.
Hot-rolled annealed sheets, No. 24	4.30c.
Galvanized sheets, No. 24	4.90c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

Base per Lb.

Mild steel bars and small shapes	3.50c.
Structural shapes	3.60c.
Reinforcing bars	prices on application
Plates	3.60c.
Hot-rolled sheets, No. 10	3.45c.
Bands	3.50c.
Hoops	3.75c.
Special threading steel	3.60c.
Diamond pattern floor plates 1/4 in. and heavier	5.60c.
Galvanized bars, bands and small shapes	6.00c.
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	4.15c.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb. All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

CHATTANOOGA

Base per Lb.

Mild steel bars	3.71c.
Iron bars	3.71c.
Reinforcing bars	3.71c.
Structural shapes	3.81c.
Plates	3.81c.
Hot-rolled sheets No. 10	3.66c.
Hot-rolled annealed sheets, No. 24*	3.56c.
Galvanized sheets No. 24*	4.16c.
Steel bands	3.91c.
Cold-finished bars	4.51c.

* Plus mill item extra.

MEMPHIS

Base per Lb.

Mild steel bars	3.82c.
Shapes, bar size	3.82c.
Iron bars	3.82c.
Structural shapes	3.92c.
Plates	3.92c.
Hot-rolled sheets, No. 10	3.77c.
Hot-rolled annealed sheets, No. 24	4.67c.
Galvanized sheets, No. 24	5.27c.
Steel bands	4.02c.
Cold-drawn rounds	4.49c.
Cold-drawn flats, squares, hexagons	6.49c.
Structural rivets	4.25c.
Bolts and nuts, per cent off list	65
Small rivets, per cent off list	50

NEW ORLEANS

Base per Lb.

Mild steel bars	3.70c.
Reinforcing bars	3.50c.
Structural shapes	3.80c.
Plates	3.80c.
Hot-rolled sheets, No. 10	3.85c.
Hot-rolled annealed sheets, No. 24	4.55c.
Galvanized sheets, No. 24	5.10c.
Steel bands	4.25c.
Cold-finished steel bars	4.75c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	\$2.80
Bolts and nuts, per cent off list	70-10

PACIFIC COAST

Base per Lb.

	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.75c.	4.00c.	3.95c.
Shapes, standard	3.75c.	4.00c.	3.95c.
Soft steel bars	3.85c.	4.00c.	4.10c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.725c.	2.725c.	3.725c.
Hot-rolled annealed sheets (No. 24)	4.65c.	4.60c.	4.85c.
Hot-rolled sheets (No. 10)	3.95c.	4.15c.	4.10c.
Galv. sheets (No. 24 and lighter)	5.25c.	5.05c.	5.35c.
Galv. sheets (No. 22 and heavier)	5.50c.	5.20c.	5.35c.
Cold finished steel			
Rounds	6.30c.	6.35c.	6.60c.
Squares and hexagons	7.55c.	7.60c.	6.60c.
Flats	8.05c.	8.10c.	7.60c.
Common wire nails—base per keg less carload	\$3.10	\$3.05	\$3.10

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

Per 1000 f.o.b. Works

High-heat duty, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	\$48.00
High-heat duty, New Jersey	58.00
High-heat duty, Ohio	43.00
Intermediate, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	43.00
Intermediate, New Jersey	46.00
No. 1, Ohio	40.00
Ground fire clay, per ton	7.00
5 per cent trade discount on fire clay brick.	

Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	\$48.00
Chicago District	57.00
Birmingham	48.00
Silica cement per net ton	3.50
5 per cent trade discount on silica brick.	

Chrome Brick

Per Net Ton

Standard f.o.b. Baltimore, Plymouth Meeting and Chester	\$47.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	47.00

Magnesite Brick

Per Net Ton

Standard f.o.b. Baltimore and Chester, Pa.	\$67.00
Chemically bonded, f.o.b. Baltimore	57.00

Grain Magnesite

Per Net Ton

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	\$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	42.00
Domestic, f.o.b. Chewelah, Wash.	24.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$22.75
F.o.b. Bethlehem, Birdsboro, and Swedeland, Pa., and Sparrows Point, Md.	22.00
Delivered Brooklyn	24.27
Delivered Newark or Jersey City	23.39
Delivered Philadelphia	22.76
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	21.00
F.o.b. Jackson, Ohio	22.75
Delivered Cincinnati	21.07
F.o.b. Duluth	21.50
F.o.b. Provo, Utah	18.50
Delivered San Francisco, Los Angeles or Seattle	23.00
F.o.b. Birmingham*	17.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of .70 and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

F.o.b. Everett, Mass.	\$22.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	21.50
F.o.b. Buffalo	20.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	20.50
Delivered Cincinnati	21.01
Delivered Canton, Ohio	21.76
Delivered Mansfield, Ohio	22.26
F.o.b. Jackson, Ohio	22.25
F.o.b. Provo, Utah	18.00
F.o.b. Birmingham	16.00

Bessemer

F.o.b. Everett, Mass.	\$23.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	23.00
Delivered Boston Switching District	24.50
Delivered Newark or Jersey City	24.39
Delivered Philadelphia	23.76
F.o.b. Buffalo and Erie, Pa., and Duluth	22.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago	21.50
F.o.b. Birmingham	22.50
Delivered Cincinnati	22.51
Delivered Canton, Ohio	22.76
Delivered Mansfield, Ohio	23.26

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y. \$25.50

Gray Forge

Valley or Pittsburgh furnace \$20.50

Charcoal

Lake Superior furnace \$23.50
Delivered Chicago 26.04

Canadian Pig Iron

Per Gross Ton

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$21.00
No. 2 fdy., sil. 1.75 to 2.25	20.50
Malleable	21.00
Basic	20.50
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.	
Domestic, 80% (carload)	\$30.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	\$26.00
50-ton lots 3-mo. shipment	24.00
F.o.b. New Orleans	26.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads)	\$69.50
50% (ton lots)	77.00
75% (carloads)	126.00
75% (ton lots)	136.00

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 6.00 to 6.50%	\$24.50
For each additional 0.5% silicon up to 17%, 50c. a ton is added.	
The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.	
Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.	

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton

10.00 to 10.50%	\$29.50
10.51 to 11.00%	30.00
11.01 to 11.50%	30.50
11.51 to 12.00%	31.00
12.01 to 12.50%	31.50
12.51 to 13.00%	32.00
13.01 to 13.50%	32.50
13.51 to 14.00%	33.00
14.01 to 14.50%	33.50
14.51 to 15.00%	34.00
15.01 to 15.50%	34.50
15.51 to 16.00%	35.00
16.01 to 16.50%	35.50
16.51 to 17.00%	36.00

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W del. carloads	\$1.30
Ferrotungsten, lots of 5000 lb.	1.35
Ferrotungsten, smaller lots	1.40
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract	10.00c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovandium, del. per lb. contained V.	\$2.70 to \$2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.	\$2.50
Ferrocobaltititanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	\$137.50
Ferrocobaltititanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	142.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton	58.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with \$3 unitage, freight equalized with Nashville, Tenn.	75.00
Ferromolybdenum, per lb. Mo del.	95c.
Calcium molybdate, per lb. Mo del.	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads	\$38.00
Ton lots or less, per ton	43.00
Silico-manganese, gross ton, delivered.	
2.50% carbon grade	85.00
2% carbon grade	90.00
1% carbon grade	100.00

Note: Spot prices are \$5 a ton higher except on 75 per cent ferrosilicon on which premium is \$10 a ton.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	\$4.80
Old range, non-Bessemer, 51.50%	4.65
Mesabi, Bessemer, 51.50%	4.65

Mesabi, non-Bessemer, 51.50%... 4.50
High phosphorus, 51.50%... 4.40

Foreign Ore

C.I.F. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria	13.50c.
Iron, low phos., Swedish, average, 68 1/2% iron	Nominal
Iron, basic or foundry, Swedish, aver. 65% iron	10.00c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed	
52%	34c.
Man., African, Indian, 44-48%	25c to 30c.
Man., African, Indian, 49-51%	30c.
Man., Brazilian, 46 to 48 1/2%	Nominal... 25c to 30c.

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid delivered nominal	\$15.25 to \$15.50
Tungsten, domestic, scheelite delivered, nominal	15.00
Chrome, 45% Cr ₂ O ₃ , lamp, c.i.f. Atlantic Seaboard (African)	\$17.50
45 to 46% Cr ₂ O ₃ (Turkish)	\$18.00 to 19.00
48% Cr ₂ O ₃ (African)	20.50
48% min. Cr ₂ O ₃ (Turkish)	20.00 to 21.00
Chrome concentrate, 50% and over Cr ₂ O ₃ c.i.f. Atlantic ports	22.00
52% Cr ₂ O ₃ (Turkish) 23.00 to 24.00	
48 to 49% Cr ₂ O ₃ (Turkish)	20.00 to 21.00

FLUORSPAR

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	\$18.00
Domestic, barge and rail	18.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	20.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	23.00
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/2% silicon, f.o.b. Illinois and Kentucky mines	35.00

FUEL OIL

Per Gal.

F.o.b. Bayonne or Baltimore	
No. 3 distillate	4.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	3.75c.
Del'd Ch'go, No. 3 industrial	4.25c.
Del'd Ch'go, No. 5 industrial	3.90c.
Del'd Cleve'd, No. 3 distillate	6.00c.
Del'd Cleve'd, No. 4 industrial	5.75c.
Del'd Cleve'd No. 5 industrial	5.00c.

COKE AND COAL

Coke Per Net Ton

Furnace, f.o.b. Connellsville, Prompt	\$4.00 to \$4.25
Foundry, f.o.b. Connellsville, Prompt	4.50 to 5.75
Foundry, by-product, Chicago ovens	9.00
Foundry, by-product, del'd New England	12.00
Foundry, by-product, del'd Newark or Jersey City	9.60 to 10.05
Foundry, by-product, Philadelphia	9.85
Foundry, by-product, delivered Cleveland	10.25
Foundry, by-product, delivered Cincinnati	9.75
Foundry, Birmingham	6.50
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal Per Net Ton

Mine run steam coal, f.o.b. W. Pa. mines	\$1.50 to \$1.75
Mine run coking coal, f.o.b. W. Pa.	1.75 to 1.90
Gas coal, 3/4-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

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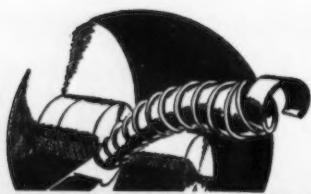
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THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

... *Settlement of General Motors strike has brightened prospects at Detroit for resumption of buying.*

o o o

... *Delays on shipments of machine tools from Cincinnati will average about 30 days.*

o o o

... *New business generally holding at a high level.*

Detroit

SETTLEMENT of the General Motors strike has considerably brightened the local machinery market. Already activity is being resumed on machinery buying programs planned by Cadillac and Pontiac divisions. It is yet too early to say what action will be taken by Chevrolet and Buick on tentative plans held in abeyance during the recent difficulties. Chrysler still shows signs of hesitation on any new programs. Plans at Plymouth and Chrysler-Jefferson are still up in the air. The proposed cylinder block line revision at Dodge Main has been postponed indefinitely. Chief interest centers in the Chrysler Canadian plant, where plans are afoot to manufacture a much larger percentage of engine details. Proposed production on Plymouth, Dodge and Chrysler engines will run about 250 units daily. Oldsmobile is also said to be contemplating the manufacture of motors at the present Chevrolet plant in Walkerville, Ont.

Recent price changes in standard machine tools have tended to clean up all available stocks, and deliveries are running as high as six to eight months.

Cleveland

THE machine tool market as a whole is rather quiet, although there is fair volume of activity in small lathes, drilling machines and a very active demand for small punch presses. Single tool orders for these machines are coming from diversified industries. The ending of the automobile strike may stimulate sales, as some prospective purchasers of single machines had postponed making commitments during the strike. With delivery dates far ahead, shipments of very few machines were suspended because

of the strike, buyers expecting that the strike would be over long before the machines on order would be shipped. Representatives of Cincinnati machinery houses report that their deliveries will be extended about 30 days because of suspensions caused by the flood. The American Fork & Hoe Co. has completed purchases of equipment for its Ashtabula, Ohio, plant. These are reported to amount to \$30,000.

Pittsburgh

INQUIRIES have been good since the first of the month and orders are being placed in good volume. All machine tools are benefiting from the all-around demand and no one item is particularly outstanding. While this district was not affected to any great extent by the automobile strike, it is expected that the settlement will have more or less a psychological effect. Dealers are optimistic as to the business over the first half of this year at least.

New York

TOOL buying is still at a high level, and deliveries are growing worse. Small builders are tied up for 30 to 60 days, while some companies are booking business now on items for 1938 delivery. No large lists have been reported out for inquiry recently. About March 1, Government buying agencies are expected to renew their interest in the machine tool market, and circulate inquiries for a sizable amount of equipment.

Cincinnati

MACHINE tool business picked up the past week where it left off prior to the flood. New business in

single and occasional multiple unit requisitions is in good volume and indicates a steady upward trend in equipment demand. Of course, lathes, millers grinders and similar lighter tools are most frequently in demand, but heavy tools show definite improvement. Planer and boring mill producers report good business for new tools, while contract job work is almost booming.

While foundries are not all in production, the rapid work of rehabilitation indicates that shortage in castings may not develop, at least not acutely.

Except for a few plants that were flooded, production is at good pace. Even those shut down by high water are rapidly rounding into operation.

Chicago

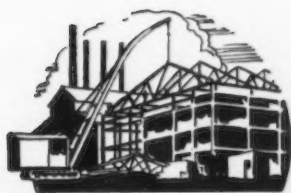
FEBRUARY sales are considerably below the January rate, and fresh inquiries do not point to a more active market. Several railroad lists are being worked, but there is noted a strong disposition by railroad purchasing agents to buy closely and to avoid the higher priced equipment. There is talk of Nash making some purchases, and Allis-Chalmers Mfg. Co. is reconsidering its plans for a plant addition. Cincinnati machine tool builders are resuming shipments, but many of them will have little opportunity to gain on long deferred deliveries.

Machine Tool Orders Recede Only Slightly

ALTHOUGH new demand for machine tools in January fell below the volume of orders placed during December, the index of orders of the National Machine Tool Builders' Association continued to show signs of exceptional activity in this field. From its all-time high in December of 257.7 per cent of the 1926 average, the index declined during January to a figure of 200.3, but remained higher than every previous month, excepting December, 1936, for a period of fully 17 years.

The figure for the month of 200.3 was combined from a figure of 156.1 for domestic orders and 44.2 for foreign, the latter business representing 22 per cent of the total. More than a third of the companies reported business twice as good as in 1926.

Discussing the situation, the report of the Machine Tool Builders' Association said, "the uprush of new business placed in December carried over strongly enough into January to suggest the formation of a new high level in the month-to-month demand for machine tools for domestic use considerably above the average level made in 1936. If that materializes, it will be the fourth consecutive step-up in demand since 1933."



PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

Johns-Manville Corp., 22 East Fortieth Street, New York, manufacturer of building and roofing products, insulation materials, etc., has authorized fund of \$3,400,000 for expansion and improvements in plants in different parts of country, including two new plants on sites soon to be selected. Of this amount about \$1,200,000 will be used for extensions in plant at Manville, N. J., recently referred to in these columns; at branch plants at Waukegan, Ill., to cost about \$275,000, and at Alexandria, Ind., cost close to \$30,000. Extensions will be made in raw material grinding and processing mill at Lompoc, Cal., including expansion in local mining properties to cost about \$81,000. One of new plants to be erected, noted, will cost approximately \$650,000 with equipment, and other such plant, close to \$100,000. At asbestos mining properties at Asbestos, Que., an expenditure of more than \$1,000,000 will be made. Company has arranged additional financing to total \$10,000,000, to provide in part for these projects.

Coca-Cola Co., North Avenue, Atlanta, Ga., has engaged Robert & Co., Bona Allen Building, architects and engineers, to prepare plans for new plant on about six acre tract, recently acquired at Kearny, N. J., comprising one, two and three-story and basement main unit, 300 x 800 ft., with several smaller structures. Cost about \$800,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 23 for steel forgings (Schedule 1000); until Feb. 26, steel forgings (Schedule 1022) for Brooklyn Navy Yard; steel compression springs for Brooklyn and Philadelphia yards (Schedule 1018).

Standard Oil Development Co., 26 Broadway, New York, an interest of Standard Oil Co. of New Jersey, has let general contract to Austin Co., 19 Rector Street, for one-story addition to plant at Bayway refinery, Linden, N. J., of last noted company, including three-story operating and office building. Cost over \$100,000 with equipment.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until Feb. 26 for 30,300 ft. lead-covered telephone cable and 30 reels (Circular 120).

Contracting and Purchasing Officer, CCC Corps Area Motor Repair Shops, Schenectady General Depot, South Schenectady, N. Y., asks bids until Feb. 26 for two steel plate blowers, three exhaust ventilating fans, one static and dynamic wheel balancer, one break drum truing and fly wheel gear-cutting machine, one runway type wheel and axle aligning rack, pneumatic angle wrench, pneumatic impact wrench, steel mechanic work benches, chain hoist trestle, two-stage type air compressor, universal motor stand, power cleaner for cleaning cooling system of automotive engines, fuel pump test and assembly stand, spray guns, electric exhaust fans, electric valve lapper, etc. (Proposal 5221-4).

Secher Brewing Co., Seventh Street, Elizabeth, N. J., plans extensions and improvements, including equipment. Cost about \$30,000.

Essex County Vocational Schools, Hall of Records, Newark, N. J., Robert O. Beebe, director, asks bids until Feb. 23 for equipment and supplies for machine, sheet metal-working, electrical, pattern-making, auto mechanics, aviation and other shops, hand tools, steel lockers, steel filing cabinets and other equipment.

Commanding Officer, Ordnance Department, Raritan Arsenal, Metuchen, N. J.,

asks bids until Feb. 25 for four portable milling machines, four combination grinders and cut-off pedestal grinders, 16 electric portable drills and four portable electric grinders (Circular 10), four portable screw-cutting 12-in. lathes (Circular 11), four electric arc welding sets, four 5-kw. and four 1½-kw. portable gasoline-electric generators (Circular 12); until Feb. 26, one combination grinder and cut-off pedestal grinder, two portable electric drills, one 5-kw. portable gasoline-electric generator (Circular 13).

Commanding Officer, Picatinny Arsenal, Dover, N. J., asks bids until Feb. 23 for thumb nuts (Circular 526), nails (Circular 527); until Feb. 25, brass screws, brass escutcheon pins, non-ferrous metal eyelets and seamless brass tubing (Circular 544).

Atlantic Refining Co., 260 South Broad Street, Philadelphia, has authorized expansion and improvements in oil refinery at Point Breeze, near Philadelphia, including new thermal polymerization plant and other equipment. Cost over \$2,000,000.

Supply Officer, Naval Aircraft Factory, Navy Yard, Philadelphia, asks bids until Feb. 23 for steel welding rods and tungsten-carbide welding rods (Aero Req. 1030), brass cones, elbows, nipples, nuts, etc. (Aero Req. 1015).

◀ BUFFALO DISTRICT ▶

Trico Products Corp., 817 Washington Street, Buffalo, manufacturer of automobile equipment, has plans for six-story addition, 100 x 265 ft., with portion 100 x 180 ft. Cost close to \$175,000 with equipment. W. R. Jewell, 33 Frontenac Avenue, is architect.

Buffalo Sewer Authority, Room 202, City Hall, Buffalo, Daniel H. McCarriagher, chairman, asks bids until March 4 for sludge dewatering machinery (Division VII), and incineration equipment (Division VIII), for Bird Island sewerage treatment project. (Estimated cost \$315,000.)

Loudon Packing Co., Terre Haute, Ind., canner and packer of food products, affiliated with American Packing Corp., Evansville, Ind., has acquired about seven acre tract at Lockport, N. Y., for new branch plant. It will include steam power house, machine shop and other mechanical departments. Cost over \$135,000 with equipment.

◀ NEW ENGLAND ▶

Bird & Son, Inc., East Walpole, Mass., manufacturer of roofing products, building specialties, etc., has acquired former textile plant of Gilmer Mills, Shreveport, La., and will remodel for branch plant. Cost over \$150,000 with machinery.

Connecticut Light & Power Co., Pearl Street, Hartford, Conn., has authorized fund of \$5,027,000 for expansion and improvements in plants and properties, including generating stations, power substations, transmission and distributing lines, and service facilities.

Pratt & Whitney Aircraft Co., South Main Street, East Hartford, Conn., has begun work on one-story addition, 80 x 150 ft., for which general contract recently was let to R. G. Bent Co., 93 Edwards Street, Hartford. Cost over \$85,000 with equipment. Albert Kahn, Inc., Detroit, is architect and engineer.

American Ordnance Corp., New London, Conn., manufacturer of munitions, has acquired domestic and foreign patent rights for manufacture of an all-purpose gun from Davison Ordnance Co., same

place, and will carry out production at local plant of Electric Boat Co., which has secured a financial interest in first noted organization.

Board of Selectmen, Longmeadow, Mass., plans manual training department in new two-story and basement junior high school, for which bids will be asked soon. Cost about \$200,000. Allen, Collens & Willis, 75 Newbury Street, Boston, are architects.

Bethlehem Shipbuilding Corp., Ltd., Quincy, Mass., a subsidiary of Bethlehem Steel Co., will build addition to plant referred to in these columns last week incorrectly under name of last noted company.

◀ WASHINGTON DIST. ▶

Chemical Warfare Service, Edgewood Arsenal, Md., asks bids until March 4 for 10 round suction filters (Circular 92); until March 5, one mechanical dryer, truck and tray type, with two complete sets of trucks and trays (Circular 96).

American Oil Co., American Building, Baltimore, has let general contract to Engineering Contracting Corp., North and Linden Avenues, for one-story addition to refinery at Curtis Bay. Cost over \$50,000 with equipment.

Construction Service, Veterans' Administration, Washington, asks bids until March 2 for one deep-well pumping unit for institution at Coatesville, Pa.

General Purchasing Officer, Panama Canal, Washington, asks bids until Feb. 26 for 165,000 ft. of rigid steel conduit, 25,000 conduit bushings, 10,000 ft. copper cable, 282,000 ft. rubber insulated wire, 1000 lb. bare copper wire, 960 lb. magnet wire, one automatic air compressor, 16 electric transformers, copper connectors, steel cap screws, brass wood screws and other equipment (Schedule 3224).

Submarine Mine Depot, Fort Monroe, Va., asks bids until March 8 for naval brass caps and naval brass end plates (Proposal 7).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 23 for 900 aircraft engine gage units (Schedule 9939), 200 aluminum alloy aircraft propeller blades (Schedule 9953), chrome molybdenum steel assemblies (Schedule 9983); until Feb. 26, 500 aircraft oxygen regulators (Schedule 9987) for Philadelphia Navy Yard; until Feb. 23, solderless cable terminal lugs (Schedule 9979) for Portsmouth yard; 11 aircraft engine cylinder radial stands (Schedule 9964), rivets, burrs and washers (Schedule 9990); until Feb. 26, parts for airplanes (Schedule 900-500), one generator with rheostats (Schedule 9993); until March 2, turbine blades (Schedule 1009), CO. indicators and spare parts (Schedule 1072) for Eastern and Western yards; steel shafts (Schedule 1023) for Portsmouth and Mare Island yards.

◀ SOUTH ATLANTIC ▶

Charleston Shipbuilding & Drydock Co., Charleston, S. C., recently reorganized, plans expansion and improvements to handle larger vessels and increased number of ships at same time, including additional shops and equipment. Cost over \$100,000. A. F. Crist is president; L. Louis Green, Jr., is general manager.

Resin Products Co., Savannah, Ga., associated with Union Bag & Paper Co., operating a local mill, has plans for one-story plant on adjoining site, 60 x 200 ft., to utilize certain waste material from paper mill. Cost over \$60,000 with equipment. D. G. Moon, plant engineer, Union Bag Company, is in charge.

Contracting Officer, Fort Benning, Ga., asks bids until Feb. 23 for one motor-driven duplex vacuum pump (Proposal 148-67).

Allen Brothers Milling Co., Columbia, S. C., has acquired two acre tract at Greenwood, S. C., for new flour mill, consisting of main four-story unit and smaller buildings. Cost close to \$75,000 with machinery.

◀ SOUTH CENTRAL ▶

Universal Atlas Cement Co., Leeds, Ala., has plans for expansion in local mill, including modernization of buildings and equipment. Several new units will be erected, including large stockhouse, packing plant and other structures; new grinding, blending, mixing, packing and other machinery will be installed, also electric shovels, conveying and miscellaneous equipment for quarry service.

Award for 12 storage bins has been made to Nicholson Co., New York, and contracts for other work will be placed soon. Cost over \$2,000,000. Main offices are at 208 South LaSalle Street, Chicago. Paul C. Van Zandt is vice-president in charge of operations.

Skelly Oil Co., Cunningham, Ky., plans extensions and improvements in oil refining plant, including installation of additional equipment. Cost close to \$50,000 with machinery. Headquarters are at Tulsa, Okla.

Falstaff Brewing Corp., 3684 Forest Park Boulevard, St. Louis, has asked bids on general contract for three-story addition to branch plant at 2600 Gravier Street, New Orleans, including improvements in present brewery. Cost close to \$150,000 with equipment. Bendernagel & Cazale, 8 Marlborough Gate, New Orleans, are architects.

Board of Education, Lexington, Ky., plans manual training department in new two-story high school for which bids will be received March 15 on general contract. Cost about \$265,000. L. K. Frankel, Lexington, is architect.

◀ SOUTHWEST ▶

Commanding Officer, St. Louis Medical Depot, Second and Arsenal Streets, St. Louis, asks bids until Feb. 24 for one motor-driven drill press, one bench type buffer, one drill press vise, one bench grinder, one finisher and one electric blower forge (Circular 16), 12 electric-operated food conveyors (Circular 17).

Phillips Petroleum Co., Bartlesville, Okla., has plans for new natural gas processing plant in Rodessa gas field, Cass County, near Linden, Tex., with air compressor station, power house and other mechanical departments. Bulk storage and distributing plant will be built. Entire project will cost over \$500,000 with equipment.

Ludlow-Saylor Wire Co., 634 South Newstead Avenue, St. Louis, manufacturer of wire cloth, screens and kindred products, has acquired building near plant and will remodel for expansion.

Common Council, Garnett, Kan., plans extensions and improvements in municipal electric power plant, including new 1000-hp. diesel engine-generator unit and auxiliary equipment. Paulette & Wilson, National Reserve Building, Topeka, Kan., and Farmers' Union Building, Salina, Kan., are consulting engineers.

Laclede Gas Light Co., 1017 Olive Street, St. Louis, will take bids soon for three-story addition to equipment storage and

service building at 526 Catalan Street. Cost over \$85,000 with equipment. Mauran, Russell & Crowell, Chemical Building, are architects.

Consumers Cotton Oil Mills, Union Stock Yards, Chicago, a subsidiary of Swift & Co., meat packers, plans new cottonseed oil mill in Lower Rio Grande Valley district, near Harlingen, Tex., with power house and other mechanical divisions. Cost over \$80,000 with equipment.

Lone Star Cement Co., Shell Building, Houston, Tex., plans storage and distributing plant on Houston ship channel, including bin units, loaders, conveyers and other mechanical-handling equipment. Cost close to \$100,000.

San Antonio Public Service Co., San Antonio, Tex., is arranging fund of \$1,400,000 for expansion and improvements in plants and system, including generating station, transmission and distributing lines, and service facilities. Chester N. Chubb is president.

◀ WESTERN PA. DIST. ▶

S. R. Dresser Mfg. Co., Fisher Avenue, Bradford, Pa., manufacturer of pipe couplings, fittings, etc., will take bids soon on general contract for two-story addition 40 x 90 ft. Cost close to \$50,000 with equipment. T. K. Hendryx, 165 Interstate Parkway, is architect.

Pennsylvania Power Co., Youngstown, Pa., has acquired former Rosena furnace property of Carnegie-Illinois Steel Corp., at New Castle, Pa., as site for equipment and service building for that area, to include complete line shop, substation department, meter department and laboratory, service and repair shops, equipment storage and distribution departments. Cost over \$100,000 with equipment.

◀ OHIO AND INDIANA ▶

Steel And Tubes, Inc., 224 East 131st Street, Cleveland, has revised plans for two one-story additions, 85 x 240 ft., and 70 x 88 ft. Cost over \$150,000 with equipment.

Lima Locomotive Works, Inc., Lima, Ohio, has plans for one-story tank shop for locomotive tender production. Cost about \$100,000 with equipment.

Art Metal Co., Kelley Avenue and East Fortieth Street, Cleveland, manufacturer of electric lighting fixtures and equipment, has leased additional space in building, address noted, for expansion Servaid Corp., manufacturer of liquid-dispensing

equipment, heretofore occupying space now being leased, has acquired floor in building at 1711 East Thirtieth Street, and will remove to that location for increased capacity.

Standard Oil Co. of Ohio, 3426 Spring Grove Avenue, Cincinnati, plans reconditioning and improving main bulk oil storage and distributing plant, recently damaged by fire and flood waters, including steel tanks and other equipment. Loss over \$600,000 with equipment.

Libbey-Owens-Ford Glass Co., Nicholas Building, Toledo, Ohio, has engaged Stone & Webster Engineering Corp., Boston, to prepare plans for extensions and improvements in steam power house and water intake system at Rossford works, near Toledo. New high-pressure boiler and other equipment will be installed. Cost about \$600,000.

Contracting Officer, Aircraft Radio Laboratory, Wright Field, Dayton, Ohio, asks bids until March 2 for steel and brass pinion wire, ball thrust bearings, bronze worm gears, brass miter gears, brass spur gears, steel racks, steel worms, die-cast racks, annular ball bearings and steel gear gages (Circular 28-ARL).

Contracting Officer, Material Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until Feb. 23 for 21,000 lb. steel grit (Circular 514); until Feb. 24, signal and lamp assemblies (Circular 473), air chucks, tire valve cores, tire valve caps, etc. (Circular 517), 15,000 hose clamps (Circular 516); until Feb. 25, 131,900 interlocking fasteners and parts (Circular 518), automatic air valve assemblies (Circular 524).

Winkler Mfg. Corp., Lebanon, Ind., recently organized by Carl J. Winkler and associates, has acquired plant and assets of Indestructible Wheel Corp., Lebanon, manufacturer of disk wheels. Plant will be expanded, with new departments for production of automobile parts and household specialties. Mr. Winkler is president and treasurer, and Herman E. Winkler, vice-president and chief engineer.

National Biscuit Co., 449 West 14th Street, New York, has awarded contract to MacDonald Engineering Co., Chicago for 1,000,000-bu. grain elevator to be erected at Toledo, Ohio.

◀ MICHIGAN DISTRICT ▶

Dunn Steel Products Co., Plymouth, Mich., manufacturer of special parts for automobiles, gear blanks, clevis pins, etc., has approved plans for one-story addition, superstructure to begin at once. Cost over \$50,000 with equipment.

Baldwin Rubber Co., Pontiac, Mich., rubber floor mats and kindred hard rubber products for automobile service, has let general contract to Darin & Armstrong, Pontiac, for one-story addition, primarily for storage and distribution. Cost close to \$100,000 with equipment. L. J. Heenan, Pontiac, is architect.

United Stove Co., Ypsilanti, Mich., is arranging financing through sale of common stock, totaling about \$228,000, part of proceeds to be used for expansion and improvements, including additional equipment.

Superior Tool Works, 6633 Rohms Avenue, Detroit, manufacturer of tools and dies, has let general contract to Austin Co., Curtis Building, for one-story addition. Cost close to \$35,000 with equipment.

B. F. Goodrich Co., Akron, Ohio, has acquired former plant of Acme Motor Truck Co., Cadillac, Mich., and will remodel for production of general line of rubber products. Cost close to \$100,000.

Schmidt Brewing Co., 1995 Wilkins Avenue, Detroit, has plans for one-story mechanical-bottling works. Cost over \$50,000 with equipment. Harley & Ellington, Inc., Stroh Building, is architect and engineer.

◀ MIDDLE WEST ▶

Chicago Flexible Shaft Co., 5600 West Roosevelt Road, Chicago, has plans for one-story addition. Cost about \$55,000 with equipment. Olsen & Urbain, 228 North LaSalle Street, are architects.

United States Engineer Office, Clock Tower Building, Rock Island, Ill., asks bids until March 4 for power control and lighting system at lock and dam No. 22, Mississippi River, near Saverton, Mo., including transformers and regulators, switchboard, feeder lines, navigation light system, service bridge lighting system, storage yard lighting system, hand-oper-

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ated traveling bridge crane, gasoline-electric standby power unit, electric tow-haulage unit, pumping equipment, central control station and equipment, etc. (Circular 132).

Commercial Metal Products Co., 2014 West Wabansia Street, Chicago, manufacturer of spun metal goods, has plans for extensions and improvements in factory at 2263 St. Paul Avenue for expansion. Cost over \$40,000. Eugene Furrer and Max Furrer, 188 West Randolph Street, are architect and engineer, respectively.

Lincoln Steel Works, 1941 Y Street, Lincoln, Neb., plans two-story and basement plant on West O Street, for iron and steel specialties. Cost close to \$100,000 with equipment.

Bureau of Reclamation, Custom House, Denver, asks bids until March 2 for 10 50 x 50 ft. regulating gates with gate frames and metal work for gate counterweights for installation in spillways at Bartlett and Mormon Flat dams, Salt River Project, Ariz., and in spillway of Parker dam (Specifications 722).

Board of Public Works, Alexandria, Minn., asks bids until Feb. 26 for stokers, forced-draft fan, combustion control and instruments, and accessories for municipal power plant. Burlingame, Hitchcock & Estabrook, Sexton Building, Minneapolis, are consulting engineers.

Pillsbury Flour Mills Co., Metropolitan Life Building, Minneapolis, has let general contract to Jones-Hettelsater Construction Co., Mutual Building, Kansas City, Mo., for nine-story addition to cereal mill at Springfield, Ill., and two multi-story additions for storage and distribution. Cost over \$750,000 with machinery, including conveying and other mechanical-handling equipment for grain elevator service.

◀ PACIFIC COAST ▶

National Automotive Fibres, Inc., 19925 Hoover Street, Detroit, and Railroad Avenue and Kennedy Street, Oakland, Cal., has awarded general contract to William P. Neil Co., 4814 Loma Vista Avenue, Los Angeles, for one-story branch plant at 5000 Randolph Street, Los Angeles, where property recently was acquired. New unit will total over 75,000 sq. ft. floor space and will include shipping dock with mechanical-handling facilities. Cost about \$250,000 with equipment. Harry T. Miller, 4814 Loma Vista Avenue, Los Angeles, is architect.

District Quartermaster, Phoenix District CCC, Phoenix, Ariz., asks bids until

Feb. 23 for four wood-working lathes, two electric grinders, four band saws, four bench saws and two bench jointers (Proposal 5807-47).

Office of Constructing Quartermaster, Sacramento, Cal., asks bids until Feb. 25 for construction of new air corps engineering shop and repair dock (Proposal 6870-14).

Swift & Co., Union Stock Yards, Chicago, and 3750 Jewel Avenue, Los Angeles, will take bids soon for addition to local packing plant, last noted address, to replace present plant at First Street and Santa Fe Avenue. Cost close to \$1,000,000 with machinery.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 23 for one bench-type drilling machine (Schedule 9958), one bench-type lathe, without bench and cabinet (Schedule 9955), one milling machine, all motor driven, six sets carbon brushes and one circular milling attachment with power-driven feed (Schedule 9974), one motor-driven milling machine, universal bench, with motor and attachments (Schedule 9962), one gasoline engine-driven tractor (Schedule 1014) for San Diego Naval Air Station; one motor-driven milling machine and accessories (Schedule 9954) for San Pedro Naval Station; until Feb. 26, high-pressure steel valves (Schedule 9996), seamless steel tubing (Schedule 9997), six hand-driven testing generators (Schedule 9981) for Mare Island, Navy Yard.

Soundview Pulp Co., Bayside, Everett, Wash., manufacturer of processed sulphite pulp, has plans for third unit of mill, on which construction will begin following completion of extensions now under way, and will consist of one and multi-story buildings. Cost about \$1,300,000 with machinery. Company is arranging for sale of stock to total close to \$1,500,000, to provide funds for work noted. Leo S. Burdon is general manager.

◀ FOREIGN ▶

Ministry of Economy and Industry, Mexico, D. F., plans new State-owned salt refinery at Viesca, Coahuila State, with power house. Cost close to \$150,000 with equipment.

British Oxygen Co., Ltd., Newcastle-on-Tyne, England, manufacturer of industrial oxygen, hydrogen and kindred products, plans new works at Vigo, England, with power house, machine shop and other mechanical divisions. Cost over \$600,000 with machinery.

Ministry of Communications, Government of Mexico, Mexico, D.F., plans new floating drydock at Vera Cruz, for reconditioning and repair of naval craft, with machine shops and other buildings. Traveling cranes, hoists and other mechanical-handling equipment will be installed. Entire project will cost over \$500,000.

State Electricity Commission, Melbourne, Victoria, Australia, asks bids until March 2 for steam power equipment for Newport power station, including watertube boilers, feedwater equipment, coal and ash-handling equipment, stack and miscellaneous equipment (Specifications 37/1).

Vactric, Ltd., 24 Basinghall Street, London, E.C., England, manufacturer of electric vacuum cleaners and parts, has arranged with Apex Electrical Mfg. Co., 1070 East 152nd Street, Cleveland, manufacturer of electric washing machines, ironers, refrigerators and kindred household equipment, for manufacture of such products in England, with exception of vacuum cleaner units made by Apex company. Plans are under way for new plant on Waterloo Road, London, for such production. Cost over \$500,000 with equipment. Subsidiary has been formed under name of Apex-Vactric, Ltd. to carry out erection and operation of plant, in which both companies noted will have an interest. A stock issue of \$150,000 (\$750,000) has been arranged, part of fund to be used for purpose stated.

British Notes

Head, Wrightson & Co., Ltd., of Thornaby-on-Tees, England, has completed a contract, believed to be the largest of its kind ever undertaken in that country for six welded girders, 12½ ft. deep by nearly 60 ft. long.

Owing to the installation of furnaces which make the minimum of smoke consistent with their work and the great increase in use of gas and electric furnaces, the density of smoke in Sheffield, England, is today much less than it was 30 years ago, when the city was making scarcely half the steel it produces today. Sheffield University is also cooperating by providing classes for boiler and furnace firemen.

Some idea of the tremendous size of the Queen Mary's sister ship now under construction may be realized from the fact that 120 boiler drums, each one calling for the casting of a steel ingot of about 164 tons, will be necessary. These must be hollow forged, heat treated, turned and machined, and generally be delivered as precise engineering jobs.

An unusual situation is reported from England where Higgs Motors, Ltd., Birmingham, has grown continually for the past nine years. Nine years ago a firm of contractors arrived at the plant to build an extension to the foundry. Today the contractors are still at work; in fact, they have never left the site. So prosperous has trade been for this organization that no sooner was the extension to the foundry completed, than it was found necessary to enlarge the main works. Then a new office block was built, followed by a works canteen. The stores were then extended, the foundry was enlarged again, an entirely new machine shop built, and the offices were enlarged to twice their former size. At the present time, it is the foundry's turn once more, and the contractors are still at work.

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